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MECHANIX ILLUSTRATED is published monthly by Fawcett Publications, Inc., Fawcett Bldg., Greenwich, Conn.

ADDRESS ALL MAIL: Subscriptions, change of address, Form 3579 to Subscription Dept., Fawcett Bldg., Greenwich, Conn.; and all editorial and advertising to Fawcett Publications, Inc., 67 W. 44th St., New York 36, N. Y.

Second-class postage paid at Greenwich, Conn., and at additional mailing offices.

EDITORIAL OFFICES: 67 W. 44th St., New York 36, N. Y. ADVERTISING OFFICES: 67 W. 44th St., New York 36, N. Y.; 612 N. Michigan Ave., Chicago 11, Ill.; 1532 Guardian Bldg., Detroit 26, Mich.; 2978 Wilshire Blvd., Los Angeles 5, Calif.; 681 Market St., San Francisco 5, Calif.; 123 S. Broad St., Philadelphia 9, Pa.; Hale Printup & Associates, Langford Bldg., Miami 32, Fla. and 1401 Peachtree St., N.E., Atlanta 9, Ga.

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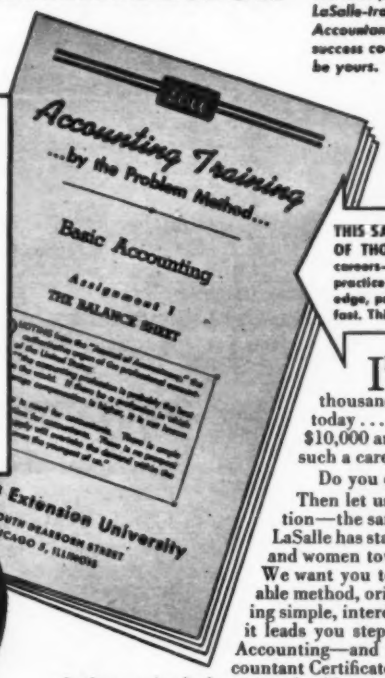

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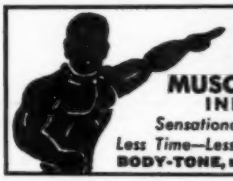

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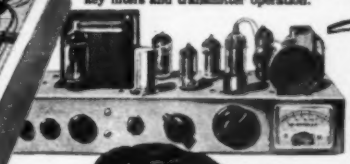

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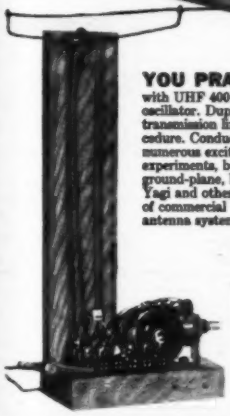

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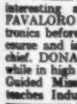

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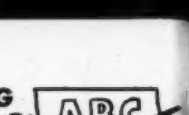

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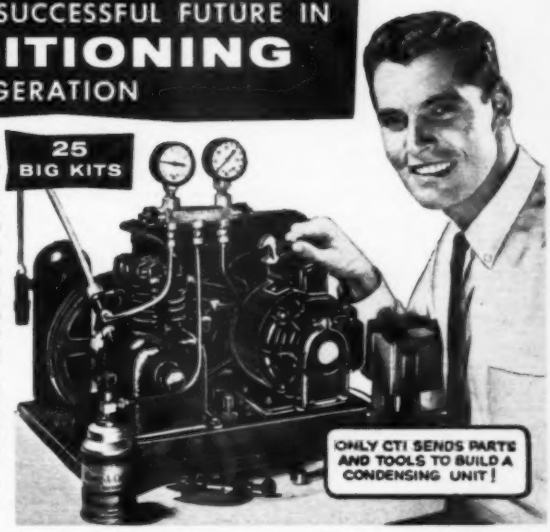

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Own a business—and enjoy independence. Thrill to the satisfaction of being the boss. Give orders—not take them! The refrigeration field is ideal for getting started on your own. You can make friends as you make service calls. In time, you'll have a list of potential customers. You can also sign service contracts with food stores, taverns, restaurants, etc. Thousands of CTI graduates have their own successful small shops.

Get Into Auto Air Conditioning

Experts say that over 400,000 air conditioners are to be installed in autos this year. The field is growing very fast. Already auto shops are advertising for skilled air conditioning mechanics. Opportunities are excellent for starting repair shops. Some day, air conditioners will be standard equipment on cars. So get in on the ground floor now. Our catalog has information on this specialized, profitable field. It's worth looking into.

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Because CTI training is so practical, you'll soon be making profitable service calls. Perhaps you'll work "on your own." Or, you may prefer to get a part-time job with a local appliance dealer or air conditioning contractor. You can add to your income this way. With extra cash, you can buy additional shop equipment, pay your tuition, even bank money. Be sure to mail coupon for complete details. Act today!—*Commercial Trades Institute, Chicago 26, Illinois.*

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Invention Clinic

Joseph H. Kraus

In this column each month Mr. Kraus will answer as many letters as space permits on those subjects he feels to be of widest general interest. Time does not allow him to reply to any letters except those printed here. Address your questions to the Invention Clinic, *Mechanix Illustrated*, 67 West 44 St., New York 36, N. Y.

Soldering Torch And Blowpipe

Ramon Z. Enriques of Batangas, Philippines, says he has developed a soldering torch and blowpipe in which the flame is concentrated, the torch can be relighted easily, no priming nor pressurization are needed and readily available fuel can be used. Being a Filipino citizen, can he patent it in the U.S.?

Indeed you can, if it is patentable. I recommend that you ask your patent attorney to report on a search. If this torch is as good as you report it to be, it should sell like hula hoops.

Jimmy-proof Attachment

Bernard Gilman of Newark, N. J., says he has invented a device which makes a common lock jimmy-proof. What are his chances for getting it on the market?

Much depends on how this device is made, how easy it is to fit to the door frame, how effective it is, and how much one needs to pay for the theoretical security. Since some of the world's finest safes have been cracked, criminals have escaped from escape-proof jails and children have penetrated the storage vaults of Fort Knox, I look with some suspicion on your claim. You had better order a patent search. There are hundreds of devices which have been patented for this purpose. Some are on the market.

INVENTOR'S TIP OF THE MONTH

Electric knife and scissors sharpeners are readily available on the market. But where is the equally inexpensive grinder capable of putting a good edge on the blade of a plane or chisel?

Easy-To-Clean Feeding Bottle

Charles Benvie of Brockton, Mass., has designed a plastic baby bottle which he feels will be much easier to clean than the standard type. Is it patentable and would it be marketable?

You are accomplishing precisely the result to be had by making a full-width cap to which the nipple is attached. There are such bottles on the market today. Your design would cost twice as much, produce a less secure unit and would cause a mess in the likely event of a leak. I doubt that you will find a favorable market for it.

New Flavor

Mrs. T. P. Washington of Edinburg, Texas, says she has developed two new flavors for carbonated soft drinks. How can she get these flavors on the market without a large initial investment?

If these are synthetic flavors you will need to guarantee their fitness for human consumption and disclose the ingredients on the bottle. If they are combinations of natural flavors, any unlabeled sample can be analyzed by a chemist anyway. Your only hope is to do the very thing which you want to avoid: investigate the pure food laws, then market the product either in carbonated form or in concentrated liquid to be mixed with carbonated water.

[*Continued on page* 12]

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Invention Clinic

[*Continued from page* 10]

Signal-Projector Device

George M. Miller of East Liverpool, Ohio, says he has procured United States and Canadian patents on a tube which can be inserted into a wall, floor or doors which indicates by reflected light that there is a light burning in the next room. It also illuminates signs or may project a picture on the wall. Don't I feel there should be a big market for this?

Yes, if the item works as you claim. I recommend that you prove your claims to yourself and prepare to prove them to others.

Surveying Rod—Dual-Use Bottle

Kent Thomas of Salt Lake City, Utah, has designed a surveying rod which gives readings directly instead of requiring subsequent calculations. He also sends diagrams and descriptions of a plastic bottle which may be converted to an entirely different purpose when empty. Should he work on these further?

Imported self-reading metric rods with movable faces are available. The problem here would be to determine what sort of protection you might be able to get for your design, who would manufacture it, and how sales can be stimulated in this rather limited market. These things should be investigated further.

The only favorable thing I can say for your plastic bottle is that you are doing some original thinking about finding a use for an article that we usually throw away. The present suggestion is not good because the cost of conversion is as great or greater than what you would need to pay for the second article. Further study here might give you a much more practical design.

MI For Easy Reference

M. W. Marple of Whitby, Ontario, Can., suggests that MI be provided with holes alongside the present staples. Then we might furnish a tool for removing the metal staples. This would make it easy to maintain a record of favorite subjects. What can we do to help him put this idea across?

Investigation will reveal that this technique, and many similar ones, have been used by magazines. Some include card size sections, some include cards, both for file purposes. Some have hole punched data sheets which are easily removed. For some publica-

[*Continued on page* 16]

I'd like to give this to my fellow men...

while I am still able to help!

I was young once, as you may be—today I am older. Not too old to enjoy the fruits of my work, but older in the sense of being wiser. And once I was poor, desperately poor. Today almost any man can stretch his income to make ends meet. Today, there are few who hunger for bread and shelter. But in my youth I knew the pinch of poverty; the emptiness of hunger; the cold stare of the creditor who would not take excuses for money. Today, all that is past. And behind my city house, my summer home, my Cadillacs, my Winter-long vacations and my sense of independence—behind all the wealth of cash and deep inner satisfaction that I enjoy—there is one simple secret. It is this secret that I would like to impart to you. If you are satisfied with a humdrum life of service to another master, turn this page now—read no more. If you are interested in a fuller life, free from bosses, free from worries, free from fears, read further. This message may be meant for you.

By Victor B. Mason

I am printing my message in a magazine. It may come to the attention of thousands of eyes. But of all those thousands, only a few will have the vision to understand. Many may read; but of a thousand only you may have the intuition, the sensitivity, to understand that what I am writing may be intended for you—may be the tide that shapes your destiny, which, taken at the crest, carries you to levels of independence beyond the dreams of avarice.

Don't misunderstand me. There is no mysticism in this. I am not speaking of occult things; of innumerable laws of nature that will sweep you to success without effort on your part. That sort of talk is *rubbish!* And anyone who tries to tell you that you can *think* your way to riches without effort is a false friend. I am too much of a realist for that. And I hope you are.

I hope you are the kind of man—if you have read this far—who knows that anything worthwhile has to be *earned!* I hope you have learned that there is no reward without effort. If you have learned this, then you may be ready to take the next step in the development of your karma—you may be ready to learn and use the secret I have to impart.

I Have All The Money I Need

In my own life I have gone beyond the need of money. I have it. I have gone beyond the need of gain. I have two businesses that pay me an income well above any amount I have need for. And, in addition, I have the satisfaction—the deep satisfaction—of knowing that I have put more than three hundred other men in businesses of their own. Since I have no need for money, the greatest satisfaction I get from life, is sharing my secret of personal independence with others—seeing them achieve the same heights of happiness that have come into my own life.

Please don't misunderstand this statement. I am not a philanthropist. I believe that charity is something that no proud man will accept. I have never seen a man who was worth his salt who would accept something for nothing. I have never met a highly successful man whom the world respected who did not sacrifice something to gain his position. And, unless you are willing to make at least half the effort, I'm not interested in giving you a "leg up" to the achievement of your goal. Frankly, I'm going to charge you something for the secret I give you. Not a lot—but enough to make me believe that you are a little above the fellows who merely "wish" for success and are not willing to sacrifice something to get it.

A Fascinating and Peculiar Business

I have a business that is peculiar—one of my businesses. The unusual thing about it is that it is needed in every little community throughout this country. But it is a business that will never be invaded by the "big fellows". It has to be handled on a local basis. No giant octopus can ever gobble up the whole thing. No big combine is ever going to destroy it. It is essentially a "one man" business that can be operated without outside help. It is a business that is good summer and winter. It is a business that is growing each year. And, it is a business that can be started on an investment so small that it is within the reach of anyone who has a television set. But it has nothing to do with television.

This business has another peculiarity. It can be started at home in spare time. No risk to present job. No risk to present income. And no need to let anyone else know you are "on your own". It can be run as a spare time business for extra money. Or, as it grows to the point where it is paying more than your present salary, it can be expanded into a full time business—overnight. It can give you a sense of personal independence that will free you forever from the fear of lay-off, loss of job, depressions, or economic reverses.

Are You Mechanically Inclined?

While the operation of this business is partly automatic, it won't run itself. If you are to use it as a stepping stone to independence, you must be able to work with your hands, use such tools as hammer and screw driver, and enjoy getting into a pair of blue jeans and rolling up your sleeves. But two hours a day of manual work will keep your "factory" running 24 hours turning out a product that has a steady and ready sale in every community. A half dollar spent for raw materials can bring you six dollars in cash—six times a day.

In this message I'm not going to try to tell you the entire story. There is not enough space on this page. And, I am not going to ask you to spend a penny now to learn the secret. I'll send you all the information, free. If you are interested in becoming independent, in becoming your own boss, in knowing the sweet fruits of success as I know them, send me your name. That's all. Just your name. I won't ask you for a penny. I'll send you all the information about one of the most fascinating businesses you can imagine. With these facts, you will make your own investigation. You will check up on conditions in your neighborhood. You will weigh and analyze the whole proposition. Then, and then only, if you decide to take the next step, I'll allow you to invest $15.00. And even then, if you decide that your fifteen dollars has been badly invested I'll return it to you. Don't hesitate to send your name. I have no salesmen. I will merely write you a long letter and send you complete facts about the business I have found to be so successful. After that, you make the decisions.

Does Happiness Hang on Your Decision?

Don't put this off. It may be a coincidence that you are reading these words right now. Or, it may be a matter that is more deeply connected with your destiny than either of us can say. There is only one thing certain: If you have read this far you are interested in the kind of independence I enjoy. And if that is true, then you must take the next step. No coupon on this advertisement. If you don't think enough of your future happiness and prosperity to write your name on a postcard and mail it to me, forget the whole thing. But if you think there is a destiny that shapes men's lives, send your name now. What I send you may convince you of the truth of this proverb. And what I send you will not cost a penny, now or at any other time.

VICTOR B. MASON
1512 Jarvis Ave., Suite M-4-F
CHICAGO 26, ILLINOIS

Address mail to: MECHANIX ILLUSTRATED, Letters Editor, 67 West 44th Street, New York 36, N. Y.

• *Otherwise*, Sayonara. . .

Can you tell me where I could find a needle valve and tank for a Fuji .099 model gas engine from Japan?

Donald Vassar
549 Armory, Apt. 185
Cincinnati 14, Ohio

Sorry. The name Fuji is the first one any loyal Japanese wants to confer on his product. There are so many small manufacturers in Japan making so many things proudly named Fuji that the Japan Trade Center, 393 Fifth Ave., New York 16, N. Y., sadly bowed out of the search for your engine. So did a prominent importer of toys and hobby supplies. But maybe some fellow reader will be able to help.

• *U.S. Rats*

Science Shorties (May MI, pg. 27) includes the startling information that "In the U. S. there are just as many rats as people." Maybe that is only helpful information but somehow I resent it. It may be the way you said it. What's the story? Did you mean anything personal by that or not?

C.P.B.
Cleveland, Ohio

If the cheese fits you, eat it!

• *We Bet It Is*

It's strange but true if you would know the reason why I ask you this question: Do you need a license and where to obtain one for an airship?

E.L.
Toronto, Canada

Before you start flying your airship (we guessed it, didn't we?) you'd better write the Dept. Of Transport, Air Service Div., Ottawa. The aviation governing body here in the U. S. is the Federal Aviation Agency, Washington 25, D. C.

• *You Savvy Our Lingo?*

I think a good invention would be a device to enable lovelorn males to dig the jive when they haven't a partner. This I've no doubt would be a very profitable machine for the firm that undertook the arduous task of putting it into production. I would be very grateful indeed if you would publish this idea or this letter as I am thinking of entering upon a journalist's career and I think this would be a good start.

J.W.R.J.
Worcestershire
England

Do we dig your jive? Our expert on British misuse of slang says you have in mind a robot dancing partner. We were relieved, as this was a more savory interpretation than ours. One word of advice on your career in journalism will not, we trust, be taken amiss? Loin English!

• *Air Safety*

The idea of "escape pods" for planes is good but wouldn't it be better to try and prevent collisions? The time has come for planes to avoid each other, the same as land and sea vehicles do. An electric eye device that would give alarms when near other planes or mountains would be perfect but lacking that, the least they could do is install plastic bubbles at the rear for a look-out post.

E. Wright
East Rochester, N. Y.

Planes come out of the soup too fast (at 1,400 mph, say) for human lookouts to be of much use in avoiding collisions. What we need is tighter air traffic control—and a way to bring damaged planes down safely.

• *1916 Enger*

In answer to Mrs. H.S. of Erie, Pa. on her wanted invention on page 91 of the March MI, the 1916 copy of the Motor Journal contained an advertisement of the 1916 Enger. This car had an operating lever to cut out six cylinders of one bank. All the exhaust valves on the one side were depressed by the device and the 12-cylinder engine operated as a six.

John W. Love
Alameda, Calif.

• *Edible Spoon*

In the January Inventions Wanted, Fern Greenwood expressed a desire for an edible spoon. We are very happy to inform you and your readers that such a spoon is available under the trade name Kandi-Spoon. We are sending you a box of our delicious Kandi-Spoons.

Charles O. Truxton
Kandi-Spoon
1146 Haddon Ave.
Camden, N. J.

Yummy!

• *Conviction*

I am a Turkish boy, 19. My tall is 1.85 meters. I am wishing to correspondence with girls from the whole world. Please, do you write my address in your magazine. I am convinced that you will do me the favor.

Kenan Aslan
Nafiz Feyzioglu Eliyle
Beyoglu Terzihanesi No. 129
Askale-Ersurum
Turkey

Why are we doing this?

[*Continued on page* 54]

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DURACLEAN COMPANY
D-176 Duraclean Bldg., Deerfield, Ill.

Invention Clinic

[*Continued from page* 12]

tions you can get complete binders; others have removable sections which allow for group binding. So there is nothing patentable here. The other side of the story is that it costs a lot of money to punch holes in more than a million copies especially when one considers that only a tiny fraction of the readers would purchase loose leaf binders to take the selected sheets. Thanks anyway.

Fire Escape

Robert J. Schenk of Bloomfield, N. J., has in mind a fire escape in the form of a steel rope with an attached lowering device for regulating speed which is to be returnable for use by the next person. Shall he spend the time, expense, and effort to further this?

About 60 items have been patented for this purpose. Where are they now? •

DON'T DO-ITS

HOW WEATHER-WISE ARE YOU?

True or False *(underline one)*

1. Heat is released in the atmosphere when rain falls. True. False.
2. Antarctic temperature data obtained during the International Geophysical year seem to confirm the world's long-term cooling trend. True. False.
3. Spring fever is an imaginary malady. True. False.
4. A barometer measures humidity. True. False.
5. When the barometer rises it means that fair weather is likely. True. False.
6. Some 68 per cent of the tornadoes in the U. S. occur during the four months from August 1 to November 30. True. False.
7. A new type of weather map was recently made from a rocket fired 86 miles into the sky that produced a photograph of a storm front. True. False.
8. More hurricanes occur in October than any other month. True. False.
9. A hygrometer is used to check the relative humidity. True. False.
10. Thunder is caused by two big clouds bumping together. True. False.

Multiple Choice *(underline one)*

11. An anemometer: measures precipitation; records wind speeds at near ground level; measures snow fall in inches.
12. The lowest temperature ever recorded was registered 13 miles from the South Pole. It was: −124° F.; −128.4° F.; −135.4° F.
13. The U. S. averages: 30 inches of rainfall a year; 60 inches; 36 inches.
14. Heart failure is four times as frequent in: hot weather; cool weather; cold weather.
15. There are: four kinds of lightning; five; six.
16. The forward speed of an average hurricane is: 10-15 mph; 8-10 mph; 16-20 mph.
17. An average thundercloud weighs: 200 tons; 1,000 tons; 150 tons.
18. Winds are considered at hurricane force at: 68 mph; 74 mph; 80 mph.
19. The record high temperature of 134° F. in the U. S. was registered at: St. Louis, Mo.; Austin, Texas; Death Valley, Calif.
20. Snow is: water vapor frozen into crystals; minute particles of a frozen cloud; melted hail.

[*Continued on page* 54]

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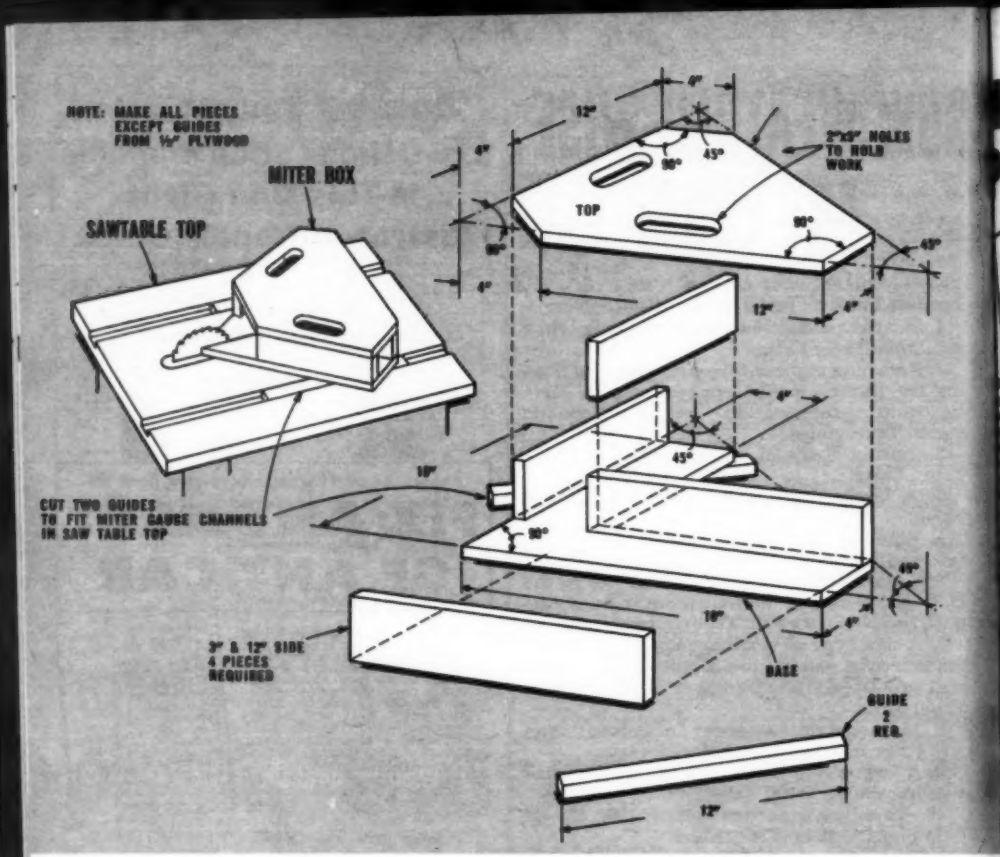

CIRCULAR SAW MITER BOX

BECAUSE I found it difficult to set my circular saw miter twice to exactly the same angle, I built the jig shown above. Made from half-inch plywood, 16 inches wide and four feet long, it took two hours to finish and turns out 45° angles every time.

The secret is that both pieces are overlapped and sawed together. If the sides of the jig meet at exactly 90° and the pieces are held securely, they have to fit. This is true even if the original 45° guide cut is a little off; so long as the pieces overlap at precisely 90°, they will mate. Naturally, it's necessary to block up one piece with scrap wood so that it will be horizontal to the table.

To install the guides, apply glue to the top surfaces and place them in the saw table channels. Then put glue on the base of the box and set it in place, aligning the 45° line to the saw blade with a square. Some nails, driven through from the top and clinched on the undersides of the guides, hold the setting until the glue dries and also improves the sliding characteristics of the jig.—*G. F. Conley*

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Coal mining is considered the most dangerous occupation.

Each year roughly 50,000 students with sufficient ability to graduate from college do not even finish high school.

Nine and one-half percent of the nation's civilian population lives in New York state.

In the Soviet Union, 43 per cent of the labor force is engaged in farming and forestry, compared to 12 per cent in the U.S.

Experiments show that automobile skids are reduced dramatically when sand particles about one-hundredth of an inch in diameter are used as the basic component of the surface mix.

By 1970 more than half the U.S. population will be at the extremes of the age scale, under 20 years of age or 65 years and older.

The sound-wave-sensitive organs of the spider are located on its legs and are divided into eight or ten tiny compartments.

In 1959 66 per cent of all rubber consumed in the U.S. was synthetic.

Egypt's Aswan High Dam is expected to be 361 feet high and three miles long, and will be capable of producing some 10,000,000 kilowatt hours of electrical power.

Switzerland is the only country in the world with a fully-automatic direct dialing telephone system.

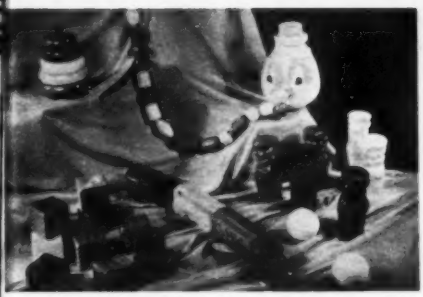
In 1959 a record total of some 400,000 cases of French cognac were sold in the U.S.

Each day American housewives open about 55,000,000 cans and other containers of food.

A map of the moon, on a scale of one inch to 80 miles, is being prepared by the Geological Survey and Army Map Service.

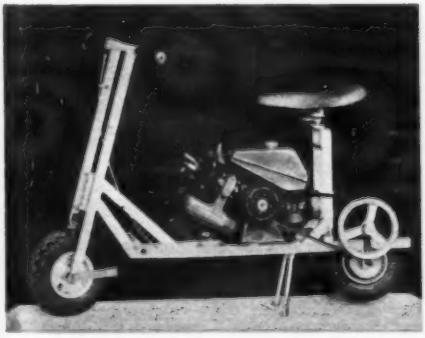
About 1,000,000 U. S. vehicles are equipped with two-way radio telephones. •

NOW SEE THIS!



NEW PLASTIC for Gerber toys is called Surfaseptic. Made by Dow Chemical, it is anti-bacterial and kills Staph organisms.

ARABELLA, newest Borgward model, is four-cylinder, front-wheel drive, 40-mpg rig. Two-door sedan sells for $1,750 at P.O.E.



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PRACTICAL RESIDENTIAL WIRING, 2ND ED. By John F. Nowak; published by Van Nostrand, Princeton, N. J. 540 pages. Price: $7.95.

THIS book gives complete information on doing every type of home electrical job in accordance with the current National Electric Code. It is a guide to performing entire electrical projects from the smallest repairs to the largest installations. It shows in detail how to read and then prepare electrical wiring diagrams of every kind. Hundreds of photographs and sketches illustrate the use of all tools in carrying out every operation. Representative installations include wiring a cottage, house, garage and workshop.

ROCKET ENCYCLOPEDIA ILLUSTRATED. Edited by John W. Herrick and Eric Burgess; Aero Publishers, Los Angeles, Calif. 607 pages. Price: $12.50.

BETWEEN the covers of this big (7¾"x 10¾") volume are the thousands of authentic definitions used in rocket research, engineering, production and testing. More than 450 photos and drawings supplement the text in clarifying the essentials of rocket power and application, propellants, engines, components, accessories, systems engineering (including missiles), test and ground equipment, military and industry facilities and historical events. Additional pages are devoted to abbreviations, symbols, engineering data and biographies of famous people in the field of rocketry. Highly recommended for those who refuse to be left in the jet stream of the Space Age.

MOTOR SCOOTER GUIDE by Richard L. Kahn; Arco Publishing Co., New York, N. Y. 126 pages. Price: $2.75.

HERE'S the up-to-date illustrated manual covering all phases of operation that motor scooter enthusiasts have been waiting for. Chapters devoted to scooter engines, electrical systems, transmissions, brakes, wheels, springs and tires are included. Scooter owners (and would-be owners) will also welcome the chapters on accessories and on buying a used scooter. Specifications and prices of all scooters available in the United States are listed, plus information on how to organize a scooter club.—*D.H.*

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PATENTS GRANTED

A BICYCLE which can be "pedaled" by the hands as well as the feet won patent 2,926,024 for co-inventors William C. Huebener of Cincinnati, Ohio, and Lawrence F. Blank of Covington, Ky. An extra chain and set of sprockets between the handlebars and front wheel axle enable the rider to hand-pedal by moving the handle bars up and down.

A body-conditioning machine that "can be adapted to the individual requirements of the user instead of the user to the device," took patent 2,927,576 for Frank J. Sibert of East Orange, N. J. He claims the device efficiently massages, vibrates, exercises, relaxes and heat-treats the body.

John H. Mosier of Cedar Lake, Ind., got patent 2,924,829 for his portable housing structure. It can be put next to your back-yard swimming pool in summer to serve as a bath house, or be placed over the swimming pool in winter to become a garage. The portable house can also be put on wheels for use as a house trailer.

People who live in small houses may like the beds invented by Ruth Nash De Long of Shaker Heights, Ohio. She devised beds that can be made up and nested one on top of the other to save space. They have hollow legs so that the legs of one bed will fit inside legs of the other. The nesting beds were granted patent 2,924,830.

A synthetic milk, claimed to overcome the disagreeable taste of previous artificial milks, was invented by Harold L. Otto of New York City. He got patent 2,923,628 for an "unsaturated fatty acid milk" that is said to look, feel, smell, pour and taste exactly like natural milk.

Alvie Carter of Salt Lake City was given patent 2,922,253 for a toy flowerpot and plant. Its hollow stem contains a motor-driven device which makes a toy bee fly up, down and around the leaves and flowers.

An improved machine for removing tree stumps by cutting them into small particles won patent 2,927,613 for Frederick L. Franzen and Martin S. Gaspardo of Manville and Long Point, Ill. The machine can easily be secured to and powered by an ordinary farm tractor and will destroy an entire stump without shifting the tractor's position. •

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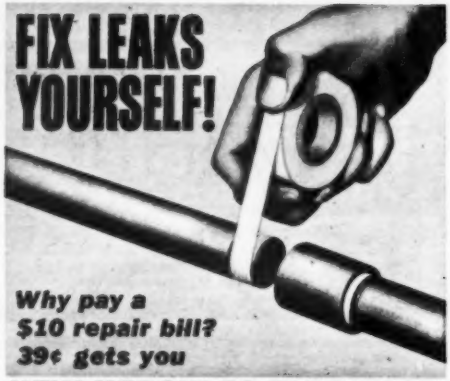

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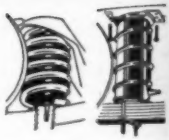

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WANTED: HOME producers, to be subcontractors. Cast plastic products for manufacturers in our Clearing House Service. Thousands of easily-made items required. Cash in at home, without previous experience. Plastic Service Associates, Dept. 6-MI, East Boston 28, Mass.

FREE! NAME Brands Catalog! Your own high profit business. Sell Name Brands, full or part time. No inventory—no investment. More than 2000 Name Brand items; lowest wholesale prices. Watches, jewelry, cameras, hi-fi, stereo, radiophonos., appliances, housewares, hardware, power tools, luggage, musical instruments, garden equipment, sporting goods, toys, many others. 8 Floors of Name Brands. Million dollar inventory. Orders shipped complete within 24 hours. Send for Free beautifully illustrated catalog Now! Separate wholesale price list. H. B. Davis Corp., Dept. 16, 145 West 15 St., New York 11, N. Y.

COLORGLAZED CONCRETE pottery made without molds. Patented method. Cemetery products, novelties, files. Basement leaksealing. Moneymaking projects. Booklets, details free. Men only. National Pottery, Grand Rapids, Minnesota.

I GOT rich in the Dry Cleaning Business —with no investment—so can you. Free details. Write—Imperial School of Dry Cleaning, Dept. MIC, 1700 Touhy Avenue, Chicago 26, Ill.

WANT TO Make Big Money At Home? $10.00 profit in an hour possible with Invisible Mending. Make tears, holes, disappear from clothing, fabrics. Steady year-round demand from cleaners, laundries, homes. Details Free. Fabricon, 6254 Broadway, Chicago 40, Ill.

LEARN SEWING Machine repairing. To $125 weekly. Sparetime. Supplies. Add to present business. Write today! Taylor Service, Box 2126, San Bernardino, Calif.

NEW HOME-IMPORT Mail Order Profitunity! Your mailbox stuffed with money! No Selling. No experience. No investment. We supply everything. Free Details. Mail Order Distributors (Import Division), 15201 South Broadway, Los Angeles A31C, Calif.

11,000 NEW PROSPECTS Daily. Baby record books, shoes, albums. Sell mail-order. Use our literature. Write: No-Co-Ro, Capitola 16, Calif.

MI Classified Advertisements

VENDING MACHINES—No selling. Operate a route of coin machines and earn amazing profits. 32-page catalog Free! Parkway Machine Corporation, Dept. 2, 715 Ensor St., Baltimore 2, Md.

BUY DIRECT from factories. Appliances, cameras, watches! Free details! Cam Co., 6810MI-20th Ave., Brooklyn 4, N. Y.

$250.00 WEEK PROFIT possible. Earn at home spare time with fascinating Printing method. $5 starts you—send no money now. Free Confidential Facts and Valuable Samples. Screen-Print JE, Los Angeles 61.

FREE PICTURE Folder, "How to Make $3,000 Yearly, Sparetime, Backyard, Raising Earthworms!" Oakhaven-45, Cedar Hill, Texas.

GROW ORCHIDS at home. Profitable, fascinating. Successful home grower explains special light, temperature and humidity conditions orchids need. Free—full details. Orchids, 100 S. Vermont, Los Angeles 4.

YOUR ENVELOPES addressed accurately, reasonably. Fast service. We have capable addressers in your city. Glenway System, Box 6548, Cleveland 1, Ohio.

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FIX TYPEWRITERS. Free Repair Course. Home operated. Remit 25¢ for book explaining Free Course and Agency Appointment. Athey, Tarentum, Penna.

$70 WEEKLY—HOME, spare time. Simplified mail bookkeeping. Immediate income—easy! Auditax, 34757E, Los Angeles 34.

BRONZE BABY Shoes: Instructions, Equipment and Mountings for genuine Electroplating Process. Largest Supplier of all Plating Equipment, Supplies. Free Catalog. Hollywood Bronze Supply, Dept. 8-5, 1624 East First, Los Angeles 33, Calif.

RE-CAST JUNK batteries into new. Latest achievements. Battery Laboratories, Bayou LaBatre, Alabama.

MONEY MAKING Machines for sale; Proven performance in thousands of shops. Acme Saw and Lawnmower Sharpeners. Free literature. Max Manufacturing Company, 138 Stockton Avenue, San Jose 26, Calif.

YOUR NAME wanted. We'll send 1000 publishers, mailers, wholesalers your name, on our list one year 25¢. Dixie Mailers, King, N. C.

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LIQUID MOLDING Rubber, Free Sample Shellcraft Supplies. Chaney, 1907-B East Road, Jacksonville 11, Fla.

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INVISIBLE REWEAVING: $5 in one hour possible reweaving burns, tears, mothholes. Spare-full time. Free details. Skil-Weave, Dept. WC-366, 335 W. Madison, Chicago 6.

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"50 NEW HOME-BUSINESS Ideas" Booklet, sample Free. Spray exotic Velvet-Suede on anything. Flokcraft-JE, Los Angeles 61.

IF YOU Like Motorcycles And Money then send for Harley-Davidson Dealership Book on how to become a dealer of motorcycles and a new line of motor scooters. Here's a chance to own your own business with a very modest investment. The youth market is beginning to explode and the next few years promise a chance to cash in on it. Write for free illustrated Dealership Book today. Harley-Davidson Motor Company, Dept. MI, Milwaukee 1, Wisconsin.

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COSTS 15¢—RETAILS $1.50. Needed Automotive Products. You manufacture, distribute, easily. Everything furnished. Wilson, Box 505-BC, Princeton, West Virginia.

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GROW MUSHROOMS. Cellar, shed and outdoors. Spare, full time, year round. We pay $4.50 lb. dried. We have 29,000 customers. Free Book. Mushrooms, Dept. 183, 2954 Admiral Way, Seattle, Wash.

MARKETS EVERYWHERE. Make Artistic concrete birdbaths, pottery. Best coloring. Home workshop. Hundred varieties. Hollywood Cementcraft, 8527-E Wonderland, Hollywood 46, Calif.

MAKE $25-$50 WEEK, clipping newspaper items for publishers. Some clippings worth $5.00 each. Particulars free. National, 81-X, Knickerbocker Station, N. Y.

PIANO TUNING learned at home quickly. Tremendous field! Musical knowledge unnecessary. Be independent! Information free. Empire School of Piano Tuning, Champaign, Ill. (Founded 1935).

$200.00 MONTHLY. SPARE Time. With Tablesaw. Write. Holiday House, 7227 4th Plain, Vancouver, Washington.

ILLUSTRATED WATCH cleaning and repairing instructions. Limited number left this series. $50.00 value for $10.00 until July. Kester, Deckerville, Mich.

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MONEY FROM Your Mailbox Daily, Free Details. Write Wayne's Service, 3016-10 Channing N.E., Washington 18, D. C.

$34.70 TWO HOURS. Manufacturing Concrete Products. No Selling. Castings #6, 1803 Fremont, Rapid City, South Dakota.

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MAKE $46 FROM Square Foot Plywood; Jigsaw necessary. Free Details. Woodet, Bridgewater, Mass.

$75.00 WEEKLY POSSIBLE mailing catalogs. Roe, 2317C Marshall, Chicago 23, Ill.

• • • HELP WANTED

BOOMING LATIN America! Prosperous Brazil, Venezuela—Only hours from the States. New data regarding jobs, opportunities, conditions. American companies employing, etc. All skills required. Salaries to $1,650.00 monthly—U. S. Tax exempt. Bonuses, living allowances, travel expenses, exciting vacations, and more! First hand information direct — $2.00 ($2.35 Airmail) checks or money orders. Latin American Opportunities, Apartado 10212, Sabana Grande, Caracas, Venezuela.

FREE INFORMATION — USA Overseas Jobs, High Pay. Transportation. Futures, Dept. L, 215 West 34th Street, New York City 1.

FOREIGN JOBS—Latin America, Alaska, Canada, up to $1500 monthly. Up-to-date 1960 Foreign Service Directory gives complete information; hot list of firms hiring for Military and Civilian Construction, Aircraft, Oil, Exporters-Importers, Mining. How-When-Where to apply. 12th successful year. $1.00. Global Reports, Box 8873-MI, Los Angeles 8, Calif.

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LATEST INFORMATION — Civil Service jobs—mechanical, clerical, professional —overseas, U.S.A. List $1.00. Civil Service Bulletin, 115R Haypath Road, Plainview, New York.

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JOB OPPORTUNITIES. Boston classified. $1.00. N.A.B., 309 So. Second St., New Bedford, Mass.

JOBS EVERYWHERE—details free. C. M. Earnest, 7320 Stewart, Portland 23, Oregon.

"GO FOREIGN!"—U. S. Companies operating in South America offer extraordinary opportunities of employment and lifetime careers. Supervisory, technical, clerical, sales, trades. Fabulous salaries, benefits! Factual information, tips—only $2.00 (Airmailed). Checks, money orders OK! Included Free: "Living Overseas" report. Globetrotter, Casilla 5439, Guayaquil 19, Ecuador.

BOOMING CALIFORNIA latest, job, business opportunities, housing information, send $1.00. Lynmac-JMI, 17620 Valerio, Van Nuys, California.

AMERICAN — OVERSEAS Jobs. Higher Pay. Transportation Paid. Men-Women. Act Now!! Free Information. Employment Headquarters, 79 Wall Street, Dept. 17-A, New York 5.

WANTED, MEN, Women, Raise bait for us at home. Full, spare time. Doesn't take up space. We furnish everything. Sherwood, Dept. C-1, Monmouth, Maine.

JOBS IN Alaska, Hawaii, foreign countries. For free information, send stamped envelope. Lovell, 3321 West Fifth, Santa Ana, Calif.

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MAKE EXTRA Money—Big Cash Commissions plus premiums for you and your customers. Sell Advertising Book Matches —sensational new Tenorama, Glamour Girls, Hillbillies; dozens others. All sizes —Quick daily sales; big repeat business. Free Master Kit makes selling easy—no experience necessary. Superior Match, Dept. FX-660, 7530 Greenwood, Chicago 19.

MEN—WOMEN! Start Money-Making Plastic Laminating Business at home in spare time. Material that costs 11¢ brings back $2.58. No canvassing or selling but mail orders bring in $20 a day. Write for full particulars Free. Rush name on postcard to Warner, Room CL-4-D, 1512 Jarvis, Chicago 26, Ill.

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MAKE BIG Easy Profits making costume jewelry at home in spare time! Quick, easy to make; easier to sell! Details Free! Don-Bar, 3511 W. Armitage, Dept. F-212, Chicago 47, Ill.

VENDING MACHINES—No selling. Operate a route of coin machines and earn amazing profits. 32-page catalog Free! Parkway Machine Corporation, Dept. 15, 715 Ensor St., Baltimore 2, Md.

YOUR NAME on our Giant Mailing List, brings you moneymaking and other mail offers galore! Send 25¢ today! Direct Mail Service, Dept. GM, Box 581, Bakersfield 5, California.

EARN $240.00 A Month at home, spare time doing only Two $5.00 Invisible Mending jobs a day. Big money paid for service that makes cuts, tears disappear from fabrics. Steady demand. Details free. Fabricon, 6256 Broadway, Chicago 40, Ill.

BIG MONEY Opportunities—Jobs, businesses, investments. Retirement opportunities. Free details. Shoreland, 20 W. Jackson, Suite 1412-M, Chicago 4.

BUSINESS OF your own. Earning potential as high as $40,000 annually. Issued on $12,500 base. No merchandise to buy. Send for free explanatory booklet. Harrell & Company, Box 8-FF, Louisville, Ill.

OPERATE PROFITABLE Home Import Business! Details Free. Direct Mail Service, Dept. IM, Box 581, Bakersfield 5, California.

$1,000.-$10,000. YEARLY POSSIBLE, raising Fish Worms! Full, sparetime; backyard, garage, basement, spare room. Sell your crop to us! Send name to: Red Wigglers, Warsaw 8, Indiana.

START YOUR Own Business On Credit (U.S. and Canada). Your own boss. 1396 Dealers sold $5,000 to $25,500 in 1959. We supply stocks, equipment on credit. 200 home necessities. Sales experience unnecessary. Pleasant profitable business backed by world-wide industry. Write Rawleigh's, Dept. F-U-MOM, Freeport, Ill.

BECOME INDEPENDENT with your own franchise business. Thousands earning handsome incomes. Request interesting facts today. National Franchise Reports, MX-528, 333 North Michigan, Chicago 1.

PROFITABLE HOMEWORK! Guaranteed Earnings. No Selling. Everything Supplied. Elvee, 556 Beacon, Manchester, N. H.

MAKE MONEY Writing Short Paragraphs! No tedious study. I tell you what to write, where and how to sell; and supply list of editors buying from beginners. Many small checks add up quickly. Write to sell, right away. Send for free facts. Benson Barret, Dept. C-78-S, 7464 Clark, Chicago 26.

START BIG-PAY Business At Home in spare time. No experience needed to operate little table-top machine for bronzing baby shoes. Make $5.46 profit on every pair. Full particulars Free. Send postcard to Mason, 1512 Jarvis, Room CM-4-D, Chicago 26, Ill.

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AFRICAN NIGHTCRAWLERS — 100 — $2.00, 500—$7.00 (Dealers Quoted). Ozark Worm Farm-4, Willow Springs, Missouri.

MAIL LETTERS Featuring Real Merchandise—Get $10 orders in every mail—$8 profit. Everything furnished. Write: The Mailerette, 1502 South Lowell, Santa Ana, California.

SELL GUARANTEED product women use. Welton, 102 Howard Ave., Ansonia, Conn.

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DYNAMIC MAIL Order Plans. Everything furnished. Information 25¢. Donovan, 79-M, Greenbelt, Levittown, New York.

MAKE MONEY Clipping Newspapers. Write Newscraft, MI-938-E. Main, Columbus 5, Ohio.

EARN MONEY using any camera. Experience not necessary. Proved method, club benefits too. Work at home, anywhere! Write today. CPC, Box 1066, Richmond, Calif.

EASY TO start rubber stamp business at home in spare time. Make up to $9.80 an hour without experience. Facts free. Write to Roberts, 1512 Jarvis, Room CR-4-D, Chicago 26.

START A Smoke Fish Business. How to salt, saltbrine, pickle and smoke fish. A real eat'en Pleasure. $1.25 postpaid. Write J. G. Osborn, P. O. Box 747, Newark, Ohio.

ATTENTION! MEN, Women! Earn extra cash, address advertising postcards. Langdons, Box 41107-M, Los Angeles 41, Calif.

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BUILDING ESTIMATING—Learn Professional Career at home. General Construction Estimating Course now available. High salary openings. Free information. Dept. A, Builders Publications, 1045 West Huntington Drive, Arcadia, California.

JOBS: HIGH pay. Foreign countries, USA. All trades. Write Dept. 55D, National Employment Information, 1020 Broad, Newark, N. J.

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FREE PICTURE Folder, "How to Make $3,000 Yearly, Sparetime, Backyard, Raising Earthworms!" Oakhaven-3, Cedar Hill, Texas.

VENDING MACHINES—No selling. Operate a route of coin machines and earn amazing profits. 32-page catalog Free! Parkway Machine Corporation, Dept. 16, 715 Ensor St., Baltimore 2, Md.

FREE BOOK "990 Successful, Little-Known Businesses." Work home! Plymouth-6L, Brooklyn 4, New York.

HIGH PAY Overseas, Domestic Jobs. Men, Women. Generous Benefits. Companies Pay Transportation. For info; write: World Wide, Dept. F, 149 N. Franklin St., Hempstead, N. Y.

AMAZING PROFITS manufacturing concrete drain tile. Coeten Products, Cornelia, Ga.

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NEW DELUXE wholesale Catalog, automobile catalog, and others. Housewares, appliances, refrigerators, freezers, washers, dryers, television, radios, furniture, clothing, luggage, binoculars, phonographs, recorders, cameras, projectors, typewriters, power tools, toys, sporting goods, watches, jewelry. Name brands. Huge discounts. Postcard (any card): Selbyco, Decatur 133, Illinois.

LARGEST WHOLESALE supply in U. S. Free catalogs. Furniture, clothing, appliances, housewares, automobiles and accessories, farm equipment, tools, hobby supplies, new products, imports. Free details. Associated Wholesalers, Box 2068M-2, Sioux City 4, Iowa.

TRANSISTOR RADIOS, Deluxe 4's, 6's. $12.75 up. Kalenak, 1100 Heeney, Johnstown, Penna.

HUGE SAVINGS on watches, perfume, luggage, cookware, rings, etc. Big catalog $1 (refundable). Spartan, 1236 Winona, Chicago.

WHOLESALE CATALOG! Housewares, appliances, jewelry, 25¢. Gentry's, 336 Racetrack Road, Fort Walton, Florida.

WHOLESALE! CATALOG 35¢ (Details 4¢). Reimer, DW-1119 Chestnut, Saginaw, Michigan.

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JEEPS—$223.00, TRUCKS—$212.00, Tractors—$68.00, Tools, Guns. Typical Government Surplus Prices. Buy Direct. List Of Depots, Procedure, Full Details Only $1.00. New York Enterprises, Wall Street Box 402-H-5, New York 5.

ARMY SURPLUS clothing, boots, camping equipment. Catalog free. Big values. Princeton 300MI Northern Blvd., Great Neck, N. Y.

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CANDLEMAKING, TERRIFIC Hobby, Great Bu$ine$$. Learn fascinating molding, dipping, creating, & decorating candles for year-'round demand—holidays, birthdays, weddings, anniversaries, All Events. Spare time fun & extra income now, expand to colorful candle shop later. No age limit. Write for Free Facts on home instruction method. Candlecraft Institute, Dept. X79, Fallbrook, Calif.

MAKE $25 TO $35 weekly addressing envelopes. Our instructions reveal how. Glenway, Box 6568, Cleveland 1, Ohio.

"8 MISTAKES PARENTS Make." Every parent should have this new book about child training. It is free; no obligation. Simply address Parents Association, Dept. 946, Pleasant Hill, Ohio.

$200. MONTHLY POSSIBLE. Sewing Babywear! No house selling! Free Information. Send name to Cuties, Warsaw 58, Indiana.

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EXPERIMENTERS: — SEARCHING For Economically Priced Chemicals And Apparatus? — Get Our Catalog — 25¢. Hagenow Laboratories, Manitowoc, Wisconsin.

CATALOG WITH 3000 Illustrations $2.00. Laboratory Materials, 1330 E. Hyde Park Blvd., Chicago 15, Illinois.

CHEMICALS AND Apparatus Catalog 25¢. Nu-Age Laboratories, Box 232, Bellmore, N. Y.

SUPPLIES CATALOG, 25¢. Special offer! Laboratory Sales, Box 161-C, Brighton, Mass.

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LATEST—BEST Formulas. Genuine Moneymakers. Free literature. Kemistry, Park Ridge 40, Ill.

EXCLUSIVE MANUFACTURING Formulas and Processes. List Free. Moon, Martville, N. Y.

10,000 FORMULAS (DETAILS Free). W. Cook, Box 1474, Poughkeepsie, N. Y.

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TRANSISTORIZED M-SCOPE unexcelled detecting treasures, gold, silver, etc. Lightweight, supersensitive, dependable. From $59.50, Easy Terms. Free Catalog. Fisher Research, Dept. C-4, Palo Alto, Calif.

TRANSISTOR TREASURE Detectors, underwater detectors. Many models. Free catalog. Gardiner Electronics Co., Dept. 3, 2545 East Indian School, Phoenix, Ariz.

GOLD-SILVER DETECTORS. Geiger Counters. Violites for tungsten, etc. Best available. Guaranteed. Information Free. Detectron, Dept. 6-A, Sylmar, California.

TREASURE! MAP, Handbook, 25¢. Locators. Howe, 811 Kansas, Atchison, Kansas.

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TYPEWRITERS, MIMEOGRAPH, Printing, Adding Machines $25.00 up. Write Dixie Graph, King, N. C.

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BUSINESS CARDS (Raised Letters) 500—$2.50, C.O.D. Samples Free. Picha, 27600 Joy, Livonia, Michigan.

1,000 BUSINESS CARDS, "Raised Letters" $3.95. Samples. Pioneer, MI-6, Island Park, N. Y.

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PRINTING OUTFITS, type, supplies. Send dime for illustrated supply book and samples. Kelsey, Inc., H-57, Meriden, Conn.

MAKE YOUR Own self-molding rubber stamps and printing cuts. Plexirubber, Argyle 3, Wisconsin.

RUBBER STAMP Presses, Supplies. Kiewiet 2025 Barney Road, Kalamazoo, Michigan.

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THREE LINE pocket stamp 75¢. 1000 name and address labels $1, 2250—$2. Free Catalog. Spartan, Dept. MI, 1236 Winona, Chicago 40.

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FREE 400 GENUINE postage stamps! Worth $10.00 at catalogue prices. Africa, Europe, Asia, British Emp.—a fascinating, valuable mixture from foreign convents, banks, etc. Lots of pleasure—who knows what you will find. Also free helpful collectors handbook. Adults only. Fine approvals enclosed. Frasek Co., MI, White Plains, N. Y.

102 DIVERSIFIED WORLDWIDE stamps 10¢. Approvals. Linstamp, St. Catharines 620, Ontario.

508 DIFFERENT WORLD-WIDE from Formosa, Morocco, Indonesia, etc., cataloging over $15.00, only 35¢. Offer to Adults Only. Approvals. Littleton Stamp Company, Littleton Q4, New Hampshire.

TERRIFIC STAMP Bargain! Israel—Iceland—Vatican Assortment—plus exotic triangle set—Also fabulous British Colonial Accumulation — Plus large stamp book—All four offers free—Send 10¢ to cover postage. Empire Stamp Corp., Dept. MI, Toronto, Can.

307 WORLDWIDE DIFFERENT stamps only 25¢. Approvals. Niagastamp, St. Catharines 673, Ontario.

FANTASTIC FISH Triangles!! Valuable "Ben Franklin" on Canal Zone!! Flaming bi-colored Volcano Triangle!! Lovely Olympics Triangle!! Plus Icy Greenland, Weird Wild Beast issue and others, 10¢ with approvals. Ozark Stamps, Spring Lake 5, Michigan.

NUDES SET (4)—unusual approvals—10¢. Atlasco, Eisenhower, Racine, Wisconsin.

FREE! $1.00 WORTH, your choice, from first selection. No strings! Adults only. Rush request now. Philatelics, Dept. VF, New Paltz, N. Y.

100 DIFFERENT BELGIUM Free. UPU. Brussels Fair, Railroad Stamps Free. Approval applicants only. Trylon, Box 31-M, Brooklyn 30, N. Y.

105 BRITISH COLONY Stamps, all different, 10¢. Approvals. Crown Stamp Company 903, Virgil, Ontario.

25 DIFFERENT LARGE Amercian Commemoratives 10¢. With approvals. Linstamp, St. Catharines 620-A, Ontario.

225 STAMPS FOR Only 10c! This mammoth value includes Airmails, Pictorials; stamps from strange Countries cataloguing up to 25c each! Also approvals. Mystic Stamp Company, Camden 30, N. Y.

QUEEN ELIZABETH On Stamps . . . A beautiful collection of 50 different stamps from 22 countries—all bearing the portrait of the Queen of England, 10¢ with approvals. Capital Stamp Co., Ferrysburg 5A, Mich.

UNITED STATES commemorative collection containing 33 different—10¢. Approvals. White, 516-M Avenue L, Brooklyn 30, New York.

1000 DIFFERENT WORLDWIDE Stamps $1.00. Valued over $20.00 Universal, Box 6, Kenosha 10, Wisc.

103 DIVERSIFIED BRITISH Colony stamps only 10¢. Approvals. Niagastamp, St. Catharines 673-A, Ontario.

ALBUM! HUNDREDS of Spaces! Only 10¢. Postpaid! Stampmart, Hartford 1, Connecticut.

FREE! 200 FOREIGN stamps. Request low priced approvals. Arkay Stamps, 1705 Acacia, Alhambra, Calif.

FREE ISRAEL set with approvals. Mehl, 1020 Thrush, Peoria, Illinois.

OLD SCARCE U. S. Seconds On Approval. Slight imperfections, lowest prices. Hernfelder, Clintonhill Sta., Newark 8, N. J.

PENNY APPROVALS; Regardless. Catalogue! Kloster, 4164 52nd St., San Diego 5, Calif.

100 STAMPS 10¢ WITH approvals. Smith, 508-D Brooks, College Station, Texas.

200 DIFFERENT U. S. Stamps $1.00. Approvals included. Shelron, Box 907-R, New York 8, N. Y.

FOR TRIFLE! Set Polynesia, Yemen, Sarawak, Borneo, multitude others. Everything 10¢ with approvals. Stamparama, Box 526, North NHP Branch, New Hyde Park, N. Y.

NO APPROVALS. 115 different colorful stamps 25¢. Continental, Box 1553, Washington 13, D. C.

100 OLD UNITED States between 1861 and 1935, $1.00. Roush Stamps, 51 Chestnut, Mansfield, Ohio.

200 DIFFERENT BELGIUM 50¢—Penny approvals included. Reed, Box 980, Chicago 90, Ill.

50 ALL DIFFERENT stamps Free with approvals. Wm. Rice, 87 Washington Ave., Kingston 34, N. Y.

U. S. STAMPS. Giant Discount Catalog 20¢. Raymax, 37-VL Maidenlane, NYC 38.

14,000 DIFFERENT! AMAZING new plan builds your collection systematically, country by country. Only 50¢ weekly. Free details. L. G. Ware, Stepney 22, Conn.

1000 DIFFERENT $1.00 (value $20.00) approvals. Jacobsen, Crompond, N. Y.

50 FREE FOREIGN Approvals. Adults. Patton's Stamps, 660 Cal., Boulder City, Nev.

FREE—ANY Volume Scott's International Albums, Scott's 1960 Catalogues, even Master Global Albums Free when you buy our sensational foreign approvals. Bargain Stamps, Redlands 1, California.

60 DIFFERENT U. S. (30 commemoratives) 25¢. No approvals. Seidenberg, Appleton, Wisconsin.

FREE! 25 EGYPT, 5¢ handling, approvals. Bellet, MI-W, Hazel Park, Michigan.

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TRADE YOUR duplicates toward our approvals! (Foreign only.) Complete information, 10¢. Variety Stamps, Box 98-L, Newton Highlands 61, Mass.

SPECIAL! OLD U. S., flags, Famous Americans, Presidents, commemoratives with approvals plus free packet, 10¢ handling. Metropolitan Stamps, Box 312EX, Jackson Heights, N. Y.

FREE UNITED States Price List Of Singles, Plate Blocks, FDC's. Introductory Discount. Bailey, 45-M Bromfield, Boston, Mass.

90,000 STAMPS SALE. Outstanding Bargain Lots. Hundreds stamps $1.00, giant assortment better stamps $5.00. High value packet $3.00. Persile, 436 N. Y. Ave., Brooklyn 25, N. Y.

FREE! LARGE Pictorial stamps. Request approvals. Dancer, 875-X6, Mansfield, Ohio.

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CUDDLES THE SHARPEST CORNERS

Lark under test at Sebring, Fla.

THAT'S ONE OF THE MANY REASONS WHY

YOU'LL LOVE THAT **LARK**

How come The Lark can corner with such sure-footed alacrity? Look underneath and you'll find a suspension system of utmost design simplicity, yet engineered to a highly refined level. Up front, hydraulic shocks are surrounded by variable rate coil springs. Spring action is progressive so that under the stress of hard cornering or rough roads, the spring rate (oscillations per minute) increases . . . as you need it. At the rear . . . good old substantial semi-elliptics, *but,* mounted asymmetrically to the wheel. Hydraulic shocks angled outwards for greater stability. And on the V-8 Lark, link-type stabilizer bar for anti-sway action. Want a pleasant surprise? See your Studebaker Dealer and try The Lark on the nearest twisting roads.

MAIL FOR McCAHILL

UNCLE TOM ANSWERS HIS MOST INTERESTING LETTERS IN THIS COLUMN. WRITE TO HIM AT *MECHANIX ILLUSTRATED*, 67 WEST 44TH ST., NEW YORK 36, N. Y.

● *Uncle Tom, for the last 20 years I've been a race fan but now I'm getting tired of the whole thing. I've been to Indy, the new Daytona track, Sebring and most of the hill climbs. I've come to the conclusion that if you've seen one, you've seen 'em all—Dullsville! I should think a guy like you might be able to dream up some new type of automobile event that would bring back some of the old thrills. How about it?*

Frank Sweeney
Buffalo, N. Y.

Your letter got me to brooding, Frank—and I think I have a race idea that would put fur on an egg. Most of us know all about hill climb contests such as Pike's Peak and Devil's Despair. Let's have some hill *descent* races! Can you imagine a race *down* Pike's Peak or any other good mountain trail? What a test for brakes, tires and pure driving skill. You'd soon find out who the real chickens were. Anyhow, I'd like to have the guard rail concession.

● *I would like to put in a bid as your youngest reader. The first issue of* MECHANIX ILLUSTRATED *I bought was in '52 at the age of eight.*

Jimmy Lobel
Montreal, Canada

You may have been the youngest reader when you started but I doubt that you are now. Age has a way of catching up with us.

● *I think my husband is insane. We have a brand-new Chrysler New Yorker and a three-year-old Jeep which he uses for hunting. Unfortunately, we only have a one-car garage and my husband insists on keeping the Jeep in the garage and our beautiful new car outside! He claims he only expects to keep the new car at the most for two years before trading in—and the Jeep has to last him for ten or more. He says two years' storage outside won't hurt the car much, if at all. Some of my friends also think my husband is rather odd about this. Do you have any suggestions?*

Mrs. L. M.
Pasadena, Calif.

Your husband may be as nutty as an East Senegalese fruitcake but he is not alone in this. You can mail *my* Nut Certificate in care of this magazine. My house has a two-car garage. In it you will find my Land Rover and Jeep. Outside you'll find my 1960 cars—for the same reason as your husband gives: the Land Rover and Jeep have to last for years but when 1961 rolls around I'll have two new regular cars. With today's modern finishes, unless you live very close to a big body of salt water, a year or more outside shouldn't affect a car's appearance in the least, providing it's washed occasionally.

● *In 1952 you tested the Hudson Hornet and from what you said in the article you liked the way it handled on the LeMans course in France. The reason I am writing to you is, because the car you tested was equipped with export suspension, something I've been trying to find out about. If you could tell me precisely what went into the export suspension I'd very much appreciate it.*

J. R. Berchok
Clairton, Pa.

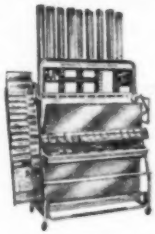
The company at the time sold heavy-duty springs and heavy-duty shocks which they called "export suspension."

● *You wrote last fall that the automobile business was the biggest gamble in the world, where millions of dollars are risked on a small model or design change. Got to thinking about this. I guess this makes all the automobile company presidents bigger than Bet-A-Million Gates ever was. Incidentally, was Gates the biggest gambler of all time, aside from these industrialists? I*

[*Continued on next page*]

Make your own
PATIO LIGHTS
easily, inexpensively
with Reynolds
DO-IT-YOURSELF
ALUMINUM

Here are two unique plans for cool-of-the-evening relaxing. Build electric or candlelight patio lamps. It's easy and inexpensive with rustproof Reynolds Do-It-Yourself Aluminum. Do a professional job in a few hours with ordinary wood-working tools and free plans.



Look for this rack at hardware and building supply stores. Your dealer has advice, material and plans for patio lights . . . or mail this coupon.

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Please send Do-It-Yourself Aluminum How-To booklet with FREE patio light plans.
Name_____
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Dept. MI

Mail For McCahill

[*Continued from page* 37]

once heard of a poker game out in the Gold Coast of San Francisco where one pot ran as high as $150,000.

Albert T. Mansfield
Minneapolis, Minn.

Those West Coast gamblers you heard about were strictly penny ante. A close friend of mine, who happily happens to be a millionaire many times over, once had to drop out of a poker game on a small Bahama island when several pots topped *five million dollars!* I later checked this with another cat who had been there and he confirmed the story. There were six men in that game, each of them worth over $100,000,000. Gates couldn't have gotten into this group as a waiter.

● *About six years ago a friend of mine built a boat called Fireball. It was 13′ 8″ in length, had a 54″ beam, a covered deck and mid-deck and stood 24″ high. The hull had a step and there were 18″ planing edges at the rear, as I remember. Last year I asked him where I could obtain the plans and he suggested I write you.*

Edward Shozda
Garden Grove, Calif.

That was nice of him. Where the hell do you obtain the plans?

● *Uncle Tom, for the last several years I've noticed that the competition seems to have stolen just about everything Chrysler has but the suspension system. How come they haven't taken this?*

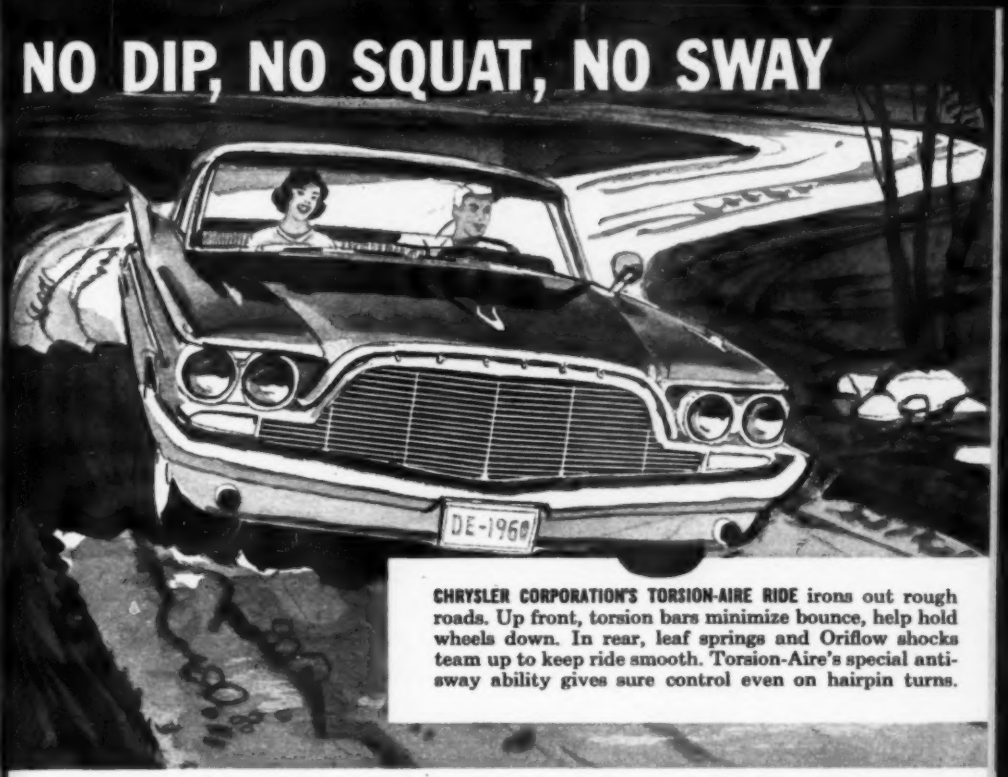
C. S. Parry
Phoenix, Ariz.

Several cars robbed Chrysler's looks—and looks are what sell automobiles, not suspension systems, I'm sorry to report. All the manufacturers realize that 85 per cent of the buyers wouldn't know a good car from a bad one if they owned it. Readers of a magazine such as this, unfortunately, are in the minority. We all know people who have driven the same make of car for a dozen or more years, even though the car may be the worst dog on the market. They can expound at the drop of bar chit how their product is superior to all others, and why. The simple fact that they haven't driven all others under varied conditions never occurs to them. They are happy with their lot through the simple expedient of not knowing any better.

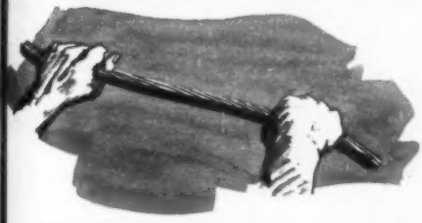
● *Somebody told me that Ford stopped making Edsel. Is this true? If so, what*

[*Continued on page* 40]

NO DIP, NO SQUAT, NO SWAY

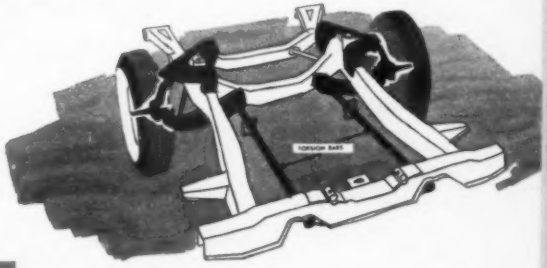


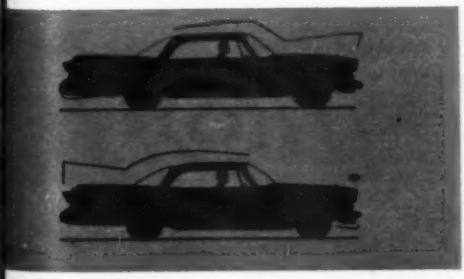
CHRYSLER CORPORATION'S TORSION-AIRE RIDE irons out rough roads. Up front, torsion bars minimize bounce, help hold wheels down. In rear, leaf springs and Oriflow shocks team up to keep ride smooth. Torsion-Aire's special anti-sway ability gives sure control even on hairpin turns.



PRECISELY POSITIONED at front wheels, pre-stressed steel torsion bars give maximum control and comfort. Anchored at the rear but free to twist and unwind up front, they adjust to any variation in road surface that tires don't soak up first.

HOW DO TORSION BARS WORK? Twist a rubber hose in your hands. Feel it resist, twist back. Torsion bars work like this—help hold wheels on road, eliminate bouncy, squashy ride often found in cars with ordinary springing.





NO MORE SQUAT, NO MORE DIP. Some cars rear back when you start fast, nose-dive when you stop. In Chrysler Corporation cars, Torsion-Aire exerts a steady, equalizing force that works to keep the car "on the level" at all times.

Only Chrysler Corporation cars offer Torsion-Aire. A drive will bring out the difference great engineering makes.

***The Quick, the Strong, and the Quiet from* CHRYSLER CORPORATION**

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Mail For McCahill

[Continued from page 38]

was the matter?

Robert Holt, Jr.
Bay, Ark.

Buyer drought.

● *Noticed in the December issue of MI that Kerby Leeson of Abilene, Texas was surprised at a $15.50 court cost for speeding. Must be one of them new Texans. That is the going rate in all Texas J.P. courts I ever heard of. They always do things big in Texas, so they say. In New Mexico we only charge $5.00.*

Harold Hannah
Loco Hills, N. M.

Okay, Texans, if you want to speed, go to New Mexico—it's cheaper.

● *Several times in the past few years you have taken potshots at Justices of the Peace in general, perhaps with due cause. Apparently some of the difficulty arises because of a few states which still keep their Justices on a fee basis. For the past 15 years, all Justices in New York State have been on a straight salary, whether they adjudicate one case or several hundred. This has eliminated much of the criticism that was incurred under the old fee system. P.S.: I'm not exactly a square, or up in an Ivory Tower. Among others, I'm also president of the Letchworth Sports Car Club, Inc.*

John K. Welch
Livingston County Magistrates Assoc.
Leicester, N. Y.

● *I just drove to Palm Beach, Fla. and took three days for the trip. I know this isn't a record run but is it average? I left New York and spent the first night in Richmond, the second night in Savannah, Ga. and made Palm Beach late in the afternoon of the third day. What bothered me a little bit was that my 300-horsepower-plus car averaged less than 14 miles per gallon for the entire trip.*

Arnold Lasker
West Palm Beach, Fla.

Just about average, Arnold—for a good driver. Some make it in two days and some drive straight through. Others often take four to five days. Back in 1928, when there were close to 800 miles of dirt road between New York and Palm Beach, I made this identical run. My log book shows that in a Chrysler Imperial 80 I duplicated your trip in that year: Richmond, Savannah and Palm Beach. As I recall, I wasn't in the least tired and averaged better than 21 mpg. My power plant was rated at 112 horsepower and had

[Continued on page 42]

"I 'built' my Chevy to be on call 24 hours a day."

"Ultra-high-speed turnpikes . . . chewed-up back country trails . . . I drive all kinds of roads in all kinds of weather. I doubt if anybody dishes out harsher treatment to a car than a country doctor like me. And I doubt if anybody depends more on that poor, overworked auto.

"So naturally I wanted a car that just wouldn't quit, no matter what. I settled on a Chevy right off, because of its taut body and rugged frame, among other things. For my money, you can't get a more dependable performer. Here's what I did with Chevrolet's whopping list of options to add up to just the car I was after:

"A Bel Air 2-door sedan, equipped with that tough six-cylinder engine and easygoing Powerglide*. That power team's as rugged as they come, I'd say. Heavy-duty battery* and generator* next—I wouldn't even have known they existed till I saw that option list.

"And I really go for that Positraction rear axle*. Brother, that's pulled me out of some mighty sticky spots. Then I picked the big heater*, a radio* and a spotlight*. Say, that light sure comes in handy when I'm out in the hinterlands looking for a patient's house!

"Rugged? You bet it is—and I wouldn't swap my Chevy for anything. Easy to drive and solid muscled, and what M.D. could ask for more?"

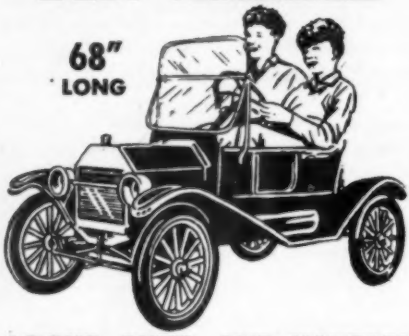
CHEVROLET

Whatever sort of car you'd like your car to be, there's a Chevy package that'll fit you like a glove. Seven perky engines . . . five transmissions . . . dozens of comfort and convenience features . . . you've got some really pleasant choosing ahead of you. We'd suggest you start soon, with a trip to your Chevrolet dealer's. . . . Chevrolet Division of General Motors, Detroit 2, Michigan. **Optional at extra cost.*

ASSEMBLE YOUR OWN

half-scale version of the famous 1910

TIN LIZZIE



LOOKS, RUNS, AND HANDLES

LIKE THE OLD "TIN LIZZIE"!

It's fun for you . . . fun for the kids. You can assemble this half-scale Tin Lizzie in a few spare evenings with simple tools. Chassis is pre-assembled; fully painted. Forward, Neutral, Reverse. Mechanical brakes. Pneumatic tires. Wood-spoked wheels. Use 2 to 3 HP engine. CARRIES TWO KIDS IN COMFORT.

COMPLETE KIT
everything but engine included

ONLY $249.50*

FULLY ASSEMBLED, with 3 HP engine . $353.00*

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BUCKBOARD

Kit contains everything but the engine; easy to assemble, with simple tools. Sturdy frame; upholstered seats. Hauls two adults easily. Forward, Neutral, and Reverse. Mechanical brakes. Use 2 to 3 HP engine. Wood-spoked wheels; Pneumatic tires. LOTS OF FUN!

Kit complete except eng. . . $149.50*

Fully Assembled, with 3 HP Engine . . $234.50*

Engines available with kits if desired.
*All prices, FOB factory.

AT DEALERS EVERYWHERE. WRITE FACTORY FOR FREE BROCHURE.

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Makers of famous Snappin' Turtle mowers
McDonough, Georgia, U. S. A.
— Our 70th Year —

Mail For McCahill

[*Continued from page* 40]

less than 5:1 compression ratio. Gasoline sold in those days everywhere at seven gallons for a buck! I averaged better than 50 mph while running and often cruised at better than 65 mph—something that would have you in many a local Bastille today before you could blink. The nicest part about the whole trip, which was made despite a complete lack of turnpikes or by-passes, was that you never saw a cop in those days south of Washington, D. C. (Boy, have we improved in the last 30 years!)

● *I was rushing home recently after a duck shooting expedition with some pals. I had to catch a plane that night for Chicago, where I had to stay for two weeks, so didn't have much time when we got home. My friend said he'd take care of the guns and the five ducks we'd shot. Guess you know what happened. He took the guns out of the trunk all right, but left the ducks there. You can imagine when I returned to my heated garage 15 days later what it was like! I've tried many kinds of household deodorants but the smell of fishy ducks still lingers on. Even the upholstery reeks. Hope you can't top this.*

J. W.
Valley Stream, N. Y.

Afraid I can come pretty close to topping it. A friend of mine who happens to be a local bank president told me about a guy who was turned down on a bank loan. This turned-down character had a real diabolical sense of revenge. He rented one of the bank's largest safe deposit boxes, placed a package in the box, took his two keys and left town the next day. What he'd deposited was a nine or ten pound fresh fish. When the fish was no longer fresh, the close quarters of the bank vault where the safe deposit boxes were soon became unbearable. It cost the bank a small fortune to remedy the situation by ripping out many boxes, after contacting as many other box owners as they could and getting court orders where necessary. Naturally, officials had to be on hand when boxes were removed, as some owners couldn't be contacted. After all, they weren't too sure which box the odor was coming from. Even police officials were called in as the odor could have been anything, including parts of a body. Needless to say, the safe deposit vault was practically inoperative for almost a week and the situation became the big laugh of the community. The crank who stank up the bank did not return.

[*Continued on page* 44]

TRIPLE EXPOSURE at *f*11 is how our Speed Graphic caught this fellow flexing his muscles. Just try this exercise yourself. See how fast you heat up, tire out. When you do, remember that your *tires* do 700 "knee bends" per mile as they roll along under your car.

Too much flexing wears out people ...and ordinary tires! But not

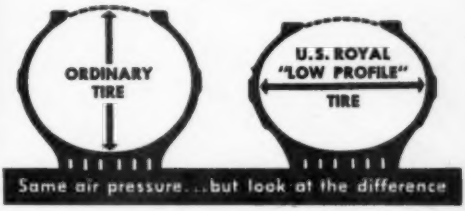
THE TIRE THAT DOESN'T GET TIRED

New *Low Profile** tire is actually made lower and wider so it flexes less, lasts longer.

Excessive flexing is what wears out, burns out tires, weakens rubber and fabric, increases blowout danger. And ordinary tires do flex excessively.

But U.S. Royal has pioneered a new "Low Profile" shape tire that *flexes less, runs cooler, lasts longer*. It offers new protection against high-speed failure and heat blowouts.

No other tire gives such thorough protection. Yet "Low Profile" tires cost no more than ordinary tires. So don't run the risk of tire failure. See the *complete* line of U.S. Royal "Low Profile" tires—now in 5 popular price ranges for every make and model car—at your U.S. Royal Dealer.



Excessive flexing pushes the temperature of ordinary tires above 240° F. That's the danger mark. But the lower, *wider* shape of U.S. Royal "Low Profile" tires reduces flex, keeps tires *cooler*, even at top highway speeds.

**"Low Profile" is United States Rubber Company's trademark for its lower, wider shape tire.*

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VIBRO-GRAVER is absolutely safe and so compact that you can work hour after hour without tiring. No skill needed . . . use it like a pencil. So easy and quick to use you can actually earn good money personalizing articles for friends and neighbors! Send no money: simply pay the postman $10.95 plus C.O.D. and postage when unit arrives. Or, send payment now and we will ship postpaid. Use your unit for 10 full days: return if not completely satisfied for full refund! Mail coupon today.

JOHN H. FAIR CO., Greyslake, Illinois

JOHN H. FAIR CO., Dept. MI-6
Greyslake, Illinois

Yes, please rush my VIBRO-GRAVER, complete with tantalum carbide point. I understand that I may use it for 10 days, and if not completely satisfied I may return it for full refund.

VIBRO-GRAVER comes complete with instructions for permanently engraving all materials.

☐ I enclose $10.95 payment in full. My unit will come postage paid.

☐ Send C.O.D. I will pay C.O.D. charges and postage on arrival.

Name.....

Address.....

City.....Zone....State.....

Mail For McCahill

[*Continued from page 42*]

● *Will you please send the name of a concentrate that can be used in modern American cars to reduce ping when it is necessary to buy second-grade gas in Mexico?*

Hub Hagens
Zephyr Cove, Nev.

Don't know of any but it sounds like a wide-open field for manufacturers of weird automotive gizmo equipment. A guy came to my house a short time ago with a bottle of stuff that worked in one high-compression car I own and failed in the other. The stuff was added to the lowest grade gas we could buy. Sorry, I mislaid him.

● *My Volvo and I are making the scene at a lazy 60 mph on a curvy road last month when a state patrol rig falls in line about three-quarters of a mile back. The fuzz dogs me eight miles to the next settlement where he puts the arm on me for speeding, apprehending me when I park at the village pub. In court, the State's Finest indicates he doesn't care to match the Volvo's cornering with his patrol car but it's obvious he was short on driving moxie because he should have eased up on me in two or three miles without using all his ponies. Ohio's patrol school does not offer training in high-speed handling and, believe me, some of the boys are running scared. I've ridden a number of hours in patrol cars as a newspaper photog, so I know. Why are states so lax in their police driver training? Ohio devotes half of its 14-week school to teaching the Ohio Highway Code. Besides, it bugs me, Dad, to be rustled by a timid cat.*

Virgil Shipley
Mount Vernon, Ohio

Timid fuzz, please note: stay in your pad and soak your flat feet. Incidentally, how many states have adequate training in driving moxie for their timid cats, those hide-behind-a-billboard cops who can only pounce on the mouse?

● *In your opinion, can any passenger car manufactured in the United States exceed a speed of 120 mph without any special engine tune-up or modification? This will settle an argument in our physics class.*

Otto Banks, Jr.
New Boston, Texas

Yes—the tri-power Pontiac and Chrysler 300, to name two right off the top. So can some lower-priced equipment with available stock options ordered from the factory.

—Tom McCahill

ONLY CUSTOMIZING THIS SIXTY PONTIAC NEEDS IS A SET OF LICENSE PLATES

One of the shrewdest customizing jobs of the year was done right on the dies where this Pontiac was made. They stamped this classic sixty with a look of distinction that'll go the distance with true car lovers.

The outside is only half the story. Inside they've outfitted the Pontiac (from Catalina through Bonneville) with interiors that'll have you looking for excuses for keeping the top down or the door open.

Underneath it all is the finest piece of passenger car machinery in the field. Not a car on the road can match its wide track . . . Pontiac's exclusive wheel design that gets the most good out of gravity. And it's been improved this year with new suspension especially keyed to this wider stance.

Take your pick of new Tempest power plants . . . most envied V-8's in the industry. Match it with the gear box and axle ratio of your choice. You've *got* it—the most respected car among those who know cars best.

PONTIAC THE ONLY CAR WITH WIDE-TRACK WHEELS

PONTIAC MOTOR DIVISION • GENERAL MOTORS CORPORATION

It's Coming!

New miracles of science that you'll be seeing soon.

TOMORROW'S automobiles may be glued together, according to adhesives experts A. Farley Thompson and Albert F. Martin of Minnesota Mining and Manufacturing Co. They report that structural adhesives can compete with welding and riveting for fastening light metals such as aluminum.

Future home ovens may be equipped with electric fans, reports Frank D. Borsenik of Michigan State University. According to Borsenik, circulating air in an oven cooks food faster at a given temperature, or enables the food to be cooked with only 67 per cent of the fuel now required.

Force-feeding forest trees additional nutrients may lead to a promising method for obtaining better growth. That's the prediction of H. A. Fowells of the U. S. Forest Service.

The world's largest radar antenna—it will have a 1,000-foot receiving dish nestled in a natural bowl of coral limestone—will soon be built in Puerto Rico to probe the surface of Jupiter and other planets. The Cornell University-designed unit will be able to probe at distances of 400,000,000 miles, operate on a peak power of 2,500,000 watts.

Direct dialing for long-distance telephone calls will require only one more whirl of the dial in the future. An operator will break in to determine the exact type of call, but all other operations, including calculation of the bill, would be automatic.

A push-button system for flashing messages from planes to ground stations is being built for the U.S. Air Force. When this system is completed, it will enable a plane to signal it is on fire or in distress in five seconds.

A diving pool with automatic controls to imitate ocean conditions will be built at Scripps Institution of Oceanography at La Jolla, Calif. The $160,000 diving facilities, including pool, towing tank and laboratory structures to help train undersea explorers, were designed by Aerojet-General Corp. for the University of California.

Next Christmas you may be able to buy a new radio fully equipped to receive stereo sound using two loudspeakers on one radio. Five technical ways to broadcast hi-fi music in stereophonic sound using only one FM radio channel have been proposed to the FCC by a National Stereo Committee of Electronic Industries Association.

The possibility that atomic radiation can be used to make better bituminous coal for some purposes has been raised by the Bureau of Mines in Washington, D. C. It could possibly lead to improvements in processes for changing coal to liquid fuels and chemicals.

A trackless train consisting of 12 or more individually powered cars to travel over highways at up to 25 mph will be studied by the Stevens Institute of Technology under a $75,000 government contract. Stevens will seek to develop a control system for the train so that one driver can control all the cars.

Accurate navigation in space and pinpoint guidance for intercontinental missiles is promised by a spinning sphere about golf ball-size that floats without mechanical support in a vacuum. General Electric is developing the "cryogenic gyroscope" which will be so accurate that golfers could make a hole-in-one with it every time.

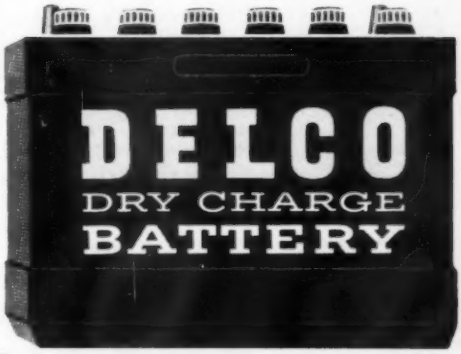
Scientists have developed a chemical that may be as effective as pruning shears in keeping ornamental plants and hedges well-trimmed. The chemical is called maleic hydrazide and experiments at the University of California have shown that the growth of plants will be effectively controlled for periods up to six weeks.

You'll soon be able to fly around the world on commercial transports in a scheduled 54 hours—San Francisco to San Francisco—thank to the coming of pure jets.

A huge 1,600-foot double-deck steel bridge will be built between New Albany, Ind., and Louisville, Ky. The Ohio River span will cost $15 million and be completed in late 1961.

—J. Robert Connor

In about a half-second, Bowser is going to take off like a jet. That's real starting power! Your car can start just as quickly with a Delco DC-12, the dry charge battery that's built to take it and dish it out. Delco's the battery you find in nearly half of today's new cars. It delivers the full, fresh power you need for today's high compression engines and multiple electrical loads. Delco batteries are a product of Delco-Remy, manufacturer of a complete line of automotive electrical parts. Your Delco dealer is the man to see for . . .



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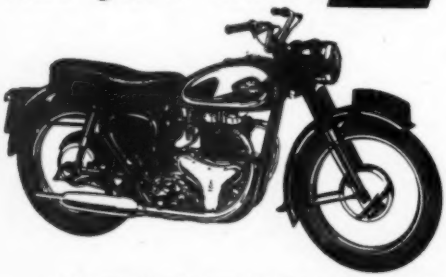
ride ***your*** *choice* **BSA**



Suit yourself from the finest selection of motorcycles ranging from a 125 c.c. single cylinder to powerful 40 cubic inch o.h.v. twins — all designed for easy handling, beautifully styled, and famous for reliability and speed.

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PANTHER PISTOL is made for cap-shooting tots who want reputation as "the fastest gun." Strapped to a leather wrist band, repeater pistol snaps into the hand with a flick of the wrist. It can also be used without band. Hubley Mfg. Co. Cost: $2.98.

EARTH PATH INDICATOR will permit our first astronaut to "see" where he is over the earth as he orbits at 18,000 mph. A small globe revolves inside the Indicator and is viewed on instrument panel. It's from Minneapolis-Honeywell Regulator Co.

Get better engine performance!

Tune up with AC FIRE-RING SPARK PLUGS

. . . and this SPECIALLY PRICED CAM-DWELL INDICATOR!

Here's a way to put your car in tune for summer driving – and keep it that way all year around. First, replace your worn spark plugs with new AC Fire-Ring Spark Plugs. Second, check your distributor point setting with this specially priced, Cam-Dwell Indicator.

AC Fire-Rings give you extra performance from a host of extra-quality, built-in features, such as AC's exclusive Hot Tip that heats faster and cools faster to burn away fouling deposits. AC's Cam-Dwell Indicator is a pocket-size professional model that home mechanics can use to put automobile ignition systems in tip-top shape.

Order your Cam-Dwell Indicator now. Get new AC Fire-Ring Spark Plugs from your nearest AC dealer – and be on your way to extra driving fun.

The AC Cam-Dwell Indicator comes with complete instructions, and for a limited time, you can get it *plus* this deluxe hard-cover, 48-page, full-color AC Space Age Atlas, for the low, low price of only $3.98.*

**Includes all sales tax and handling charges.*

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Please send me _____ AC Cam-Dwell Indicator(s) and Space Age Atlas(es) at $3.98* per set. Enclosed is check ☐, M.O. ☐. Make check or money order payable to: AC Spark Plug Division.

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Command Performance- with GRAVELY Power!

Gravely does the jobs other tractors can't! The unmatched performance of the Gravely Tractor gives you dependable POWER at your command to mechanize your lawn, garden and farm jobs.

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Many others "cleaning up"—so can you! Amazing tiny new extinguisher ends fires fast as 2 seconds. Guaranteed 20 years! Sells for only $4.95! Write for FREE Sales Kit. No obligation. Merlite Industries, Inc., Dept. P-10P, Presto Div., 114 East 32 Street, New York 16, N. Y.

T-6

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Ready-made markets await local manufacturers of concrete drain tile. Every year demand is greater than production.

With a Champion machine you can convert $21.50 worth of sand and cement into 1000 4" superfine concrete drain tile, and at $80.00 you can undersell ordinary clay tile. You have both quality and price in your favor. The Champion makes all sizes from 3" to 12" diameter; 1-man operation with automatic feeder. Requires no special building—no skilled labor. Moderate investment, with 3 years to pay. Write at once for the Champion Book.

W. E. DUNN MFG. CO. • 523 W. 24th St., Holland, Mich.

NOW SEE THIS!

POCKET-SIZE Geiger counter is powered by two penlight batteries. The presence of radioactive ores is signaled by loud clicks. From Felman Instrument Co. $89.

CONCRETE CROSSTIES are installed in test bed on Seaboard Airline Railroad. Tampa, Fla. Prestressing of wire strands embedded in ties is said to prevent cracking. Concrete ties also outlast wooden ones. From the American Concrete Crosstie Corp.

WORLD CHAMPION McCULLOCH

GO WITH THE HOT ENGINES FOR KARTS

The World Champion McCulloch MC-10 (SUPER A)

Winner of Super A, Super B and over-all International Trophy Winner at Grand Prix de Karts, Nassau!

Super A, Go Kart Club of America approved • Weighs only 10 lbs. • 5.3 cubic inches • More than 1 hp per cubic inch • High RPM with minimum power drop-off • Needle rod bearings—ball mains.

List price f.o.b. Los Angeles: **$125.00**

The New McCulloch MC-5 (STOCK A)

Little brother of the World Champ MC-10! Winner in Stock A, Stock B!

Another *hot* engine for karts! McCulloch's new MC-5 is hot on the heels of the world champion MC-10. One MC-5 qualifies for Go Kart Club of America class Stock A, two MC-5s for Stock B. Either way, you've got a sizzling power plant that just won't quit . . . on corners or straights . . . five laps or five hundred.

• 10,000 to 12,000 RPM • New short-stroke design • Special positive-pressure, deep-breathing carburetor • Die-cast, deep-finned aluminum cylinder • Precision cast-iron sleeve.

List price f.o.b. Los Angeles: **$99.50**

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the hot engines for Karts

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Resilient Neoprene CUSHION GRIP lets you turn screws tighter with less work—and you don't hurt your hands. Tested and approved by Mechanics

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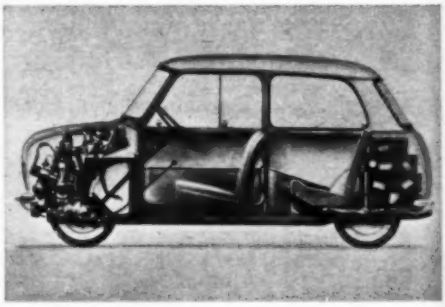
$1295 SMALL CAR

AUSTIN and Morris 850 cars are small new English twins identical except for their grilles. They sport an ingenious crosswise mounting of the front-wheel drive and water-cooled, four-cylinder engine which gives speeds over 70 mph, at up to 45 mpg. The entire transmission is directly below the engine and has a four-speed gearbox. The unusual design eliminates the drive shaft and allows 80 per cent of the car's ten-foot length to be used for its four passengers. •

850 has new type of independent suspension on all wheels, boasts unusually wide doors.



DESIGN even allows room for luggage. Entire engine can be taken from car in 20 minutes.

OCTANE'S TOO LOW when combustion takes place too soon, causing engine to "knock."

OCTANE'S JUST RIGHT when combustion takes place at right moment, giving quiet, powerful performance.

What octane really means

"Octane" is a number which petroleum engineers use to rate a gasoline's freedom from "knock" or "ping" when it's burned in an engine.

Knocking occurs when the fuel-air mixture in the combustion chamber of a cylinder explodes prematurely or "detonates." It's usually caused by gasoline too low in octane, and it can result in loss of power and damage to expensive engine parts.

When the octane is just right, the gasoline burns smoothly and prevents knocking. Your engine gives you all the smooth, quiet, powerful performance it can deliver.

But octane is only one of the many properties of a good gasoline. For example, quick starting, smooth warmup, maximum power, best performance, top economy and freedom from vapor lock are all affected by climate and altitude which vary in different areas.

Through selective blending, Texaco's gasolines are "100% climate controlled." This means that Texaco changes the blends not just seasonally, but every month of the year for 26 different climate and altitude areas throughout the country.

That's why, when you fill up with top-octane Sky Chief Su-preme with engine-saving Petrox, or famous *regular-price* Fire Chief gasoline, you can be sure you're getting the right blend for top performance and economy. You drive with more pleasure... and save for good measure!

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7 times faster than brushing!

Speedy Sprayer

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Heilite camping trailers make up into a complete camp for a family of 5—in just one minute. Clean, comfortable fully-floored tent, ready-made double bed, ample storage space for gear. Now in single and two-wheel (compact car) models.

FREE COLOR FOLDER, write—

HEILITE TRAILERS, INC.

1328 SO. SACRAMENTO ST. • LODI, CALIF.

Dear Editor

[Continued from page 15]

• *Quickie Answers*

H. L. Fields, Jr., Raleigh, N. C.: you can write to the Rathkamp Match Cover Society (Mr. Howard Rush) at 7102 Foster St., Benning Station, Washington 4, D. C., for albums and catalogs.

Record collectors: Robert Rang, 8709 Elba Way, Orlando, Fla., has a number of 78-rpm platters he believes to be collectors' items. We have put him in touch with the Merit Music Shop, 13 West 46 St., New York 36, N. Y., which advertises "collections bought and sold."

All those who wanted to buy Rhythmographs (Oct. MI, Meter Predicts Your Moods) can write to Biorhythm Computers, Inc., 28 East 22nd St., New York 10, N. Y.

• *Electrics Steamed Him Up*

Recently finished your article entitled Electric Cars Are News Again. (Oct. MI) It whetted my appetite to read about another type of automobile which is even more interesting than the electric car—the steam automobile. Sure would like to know what—if anything—is being done to put a steam automobile on the market again. Or would like to get details on automobiles that have been converted to steam. How about it?

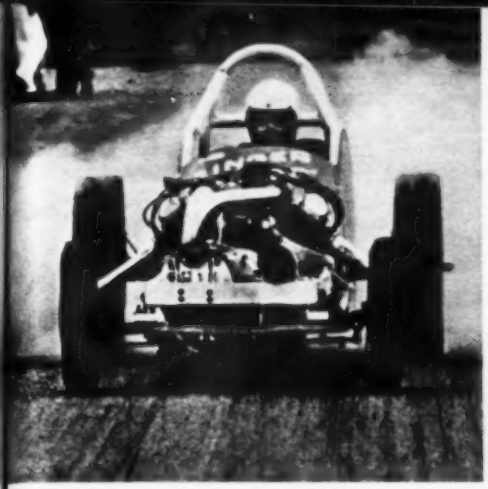
Jon K. Moon
HQS, USA AAC C.P.O.
APO 20, San Francisco

You should know that there is a Steam Automobile Club of America. Carl Guth, Secretary, receives mail at 6727 N. 13th Pl., Phoenix, Ariz. Floyd Clymer Publications, 1268 Alvarado St., Los Angeles 6, Calif., has two $2 books on the subject—Steam Car Scrapbook, and The Modern Steam Car And Its Background

WEATHER QUIZ ANSWERS

[Continued from page 17]

1. True. 2. False. The world is now in a long-term warming trend. 3. False. Science has proved that "spring fever" is caused by seasonal change. 4. False. Barometer measures air pressure. 5. True. 6. False. April 1 to July 31. 7. True. 8. False. September. 9. True. 10. False. Lightning heats the air in its path almost instantly, causing a tremendous and sudden expansion of the atmosphere. This causes vibration or thunder. 11. Records wind speeds. 12. —135.4° F. 13. 30 inches. 14. Cold weather. 15. Six kinds. 16. Ten to 15 mph. 17. 150 tons. 18. 74 mph. 19. Death Valley, Calif. 20. Water vapor frozen into crystals.



All 5 top drag racers in '59 used Champion spark plugs . . .

Every major U. S. outboard maker uses Champions.

All major power-mower engine makers use Champion spark plugs . . .

Over twice as many car makers use Champions.

Q. Why do the experts, in field after field where performance is vital, use Champion spark plugs?

A. Because they know they can depend on Champions to deliver every bit of performance out of every drop of gas. Your car—or any engine you own—will start quicker, perform better and save on gasoline with new Champions. Put a new set in your car every 10,000 miles!

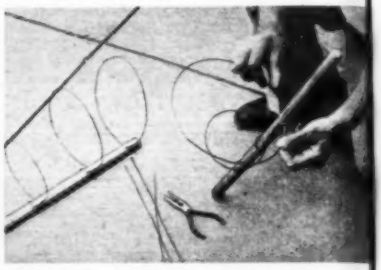
Worn spark plugs waste lots of gas—so check your plugs every 5,000 miles!

CHAMPION

GARDEN HOOPS

WIRE HOOPS fastened to garden stakes support these plants and protect them from damage by wind and rain.

WIRE garment hangers can provide the support required for heavy plants such as tomatoes and dahlias. Open a hanger and then form it into a hoop by bending it around a flower pot. Pass the ends through one of the ⅛-inch holes drilled through the broomstick stakes and twist them so the hoop stands at right angles to the stake. •



SECURE the hoops by bending them through holes in stakes.

FREE HI-FI TEST RECORD IN THE JUNE ISSUE OF EI*

*ELECTRONICS ILLUSTRATED

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It's **up to you!** The Army's new "Choose-it-Yourself" System lets you pick valuable training before you enlist. Here's how it works: **1. Choose** before enlistment. Choose your training from fields like Auto Mechanics, Missiles, Aircraft Maintenance, Meteorology, Surveying—and many more. **2. Qualify** before enlistment. Take aptitude and physical exams to qualify for the training you've chosen. **3. Know** before enlistment. If you qualify, you know you'll get the training you want. Your choice is written into your future Army record—guaranteed before you enlist. **Choose, qualify, know—this week!** Ask your Army recruiter to show you his complete list of available training fields.

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CHOOSE IT YOURSELF VOCATIONAL TRAINING SYSTEM

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Get satisfying flavor...so friendly to your taste!

NO FLAT "FILTERED-OUT" FLAVOR!
NO DRY "SMOKED-OUT" TASTE!

You can light either end!

See how Pall Mall's famous length of fine, rich-tasting tobacco travels and gentles the smoke—makes it mild—but does not filter out that satisfying flavor!

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2 Pall Mall's famous length travels and gentles the smoke naturally . . .

3 Travels it over, under, around and through Pall Mall's fine tobaccos . . . and makes it mild!

OUTSTANDING...and they are MILD!

© A. T. Co. *Product of The American Tobacco Company—"Tobacco is our middle name"*

te!

end!

MECHANIX ILLUSTRATED
June 1960

McCAHILL TESTS THE NEW

COMET

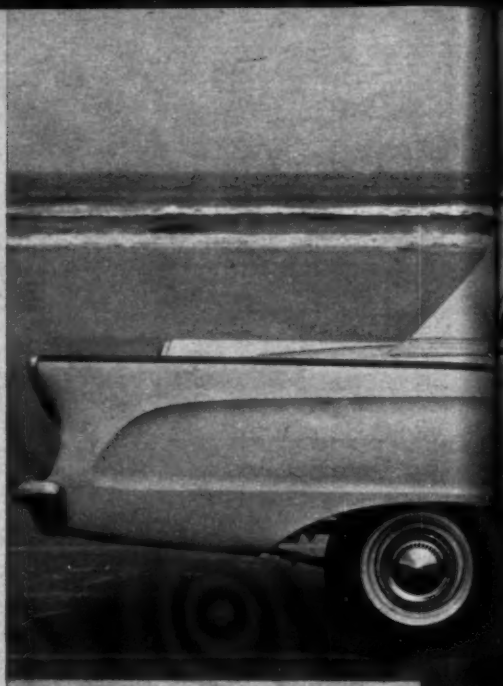
"Ford's new compact offers a comfortable ride, clean looks and fine performance."

By Tom McCahill

TO my way of thinking, Ford Motor Co.'s new Comet is one of the best-looking small cars to hit the American market. It has stolen the best of Ford's designs, principally the Galaxie (which stole *its* roofline from the Thunderbird). I like everything about the car's looks except those silly dual headlights.

The Comet, it would appear to be, is the first of a long line of new compact cars about to descend on the nation. The initial success of the Falcon, Corvair and Valiant has stirred other divisions

COMET uses best of Ford's designs, says Uncle Tom—including Galaxie's roofline.



TEST CAR SPECS

MODEL TESTED: **1960 Comet two-door sedan**

ENGINE: **6** cyls; **144.3** cubic ins; **90** brake hp; **138** ft-lbs max torque; **8.7** to 1 compression ratio. Bore **3.50** ins; stroke **2.50** ins. Fuel required: **Regular.** Standard axle ratio: **3.56.** Wheelbase **114** ins; length **194.9** ins; height **54.5** ins; width **70.4** ins; front tread **55** ins; rear tread **54.5** ins. Weight **2500** lbs. Gas tank capacity **14** gals. Turning circle diameter **39.9** ft. Tire size **6.00X13.**
PRICE (without optionals): **$1,990**
PERFORMANCE: **0-30** mph, **5.1** secs; **0-60** mph, **17.1** secs; **0-50**, **13.4** secs; **40-60** mph, **6.8** secs. Top speed **89** mph. All times recorded on corrected speedometer.

CANTED fins and tail-lights are outlined with chrome strips, give a crisp effect.

TRUNK SPACE, Jim McMichael up, is huge for a compact, amounts to 26.6 cubic ft.

REAR WINDOW shows Thunderbird influence, adds to Comet's look of clean styling.

HARD TURNS showed no roll-over tendency, proved car's easy handling at top speeds.

in the Big Three to take the final step and launch the small cars they've all had waiting on their design boards, in case the three upstarts proved successful. As this goes to press there are several others being readied. Popular rumor has it that Ford may come out with still another car, more of Volkswagen proportions, to sell at VW prices. Pontiac reportedly has a new compact due in October—and so it goes.

The Comet entry has a lot to recommend it. I picked up my test car from an old friend, Paul Cox, Daytona's Lincoln-Mercury dealer. Basically, the Comet is a re-worked Falcon, with some additions. For example, the wheelbase is 114 inches, which is pretty near standard Ford size of not too many years ago. This is 4½ inches longer than the Falcon sedan but, by an odd twist, the Comet station wagon has the same 109.5-inch wheelbase as its little Ford brother. The power plants are identical.

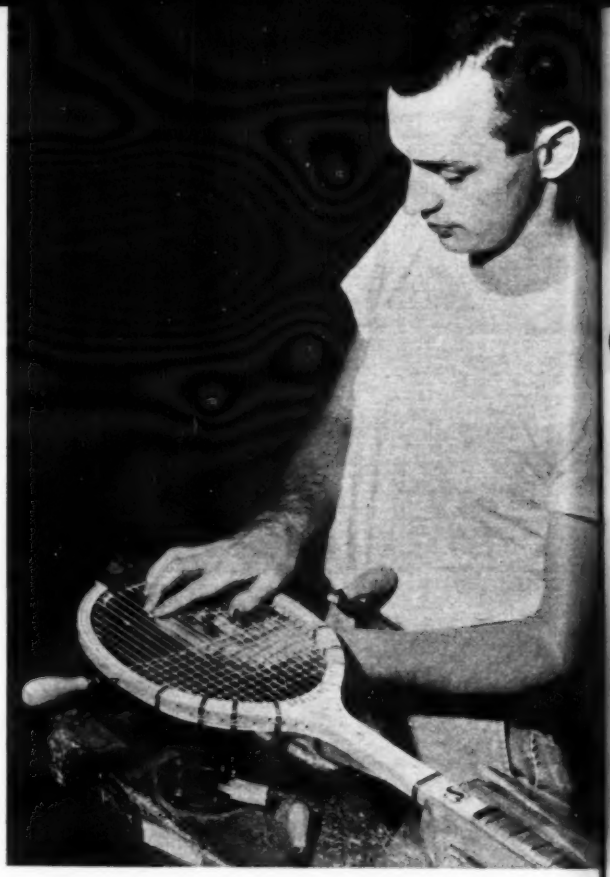
Unfortunately, when we made our Falcon test in the October '59 issue, the test car was equipped with an automatic transmission which threw a damper on performance. With the automatic transmission the Falcon averaged 21.7 seconds for 0-60 mph. We pointed out in that article that engineering tests showed that the stick job (which was not available at test time) was about four seconds faster for 0-60 mph. Well, the Comet with its stick shift banged out 0-60 mph in 17.1 to 17.5 seconds in 12 different runs at the Daytona International Speedway—which is pretty good.

The Comet uses, with a stick shift, a 3.56 rear-axle ratio to the Falcon's 3.10. The Comet weighs two cases of gin more than the Falcon which is not enough to offset this difference in axle ratios. It's a fair bet that, equally equipped, the Comet will shave the Falcon in all performance runs, including top speed. There just aren't enough guts with either ratio to unravel these jobs to their full possible [*Continued on page* 158]

HOW TO RESTRING A TENNIS RACKET

Here's how-to that can make money for man or boy for a very small outlay.

By John A. Kraft, Jr.



HEAD CLAMP and vise are essential equipment.
Photo from A. G. Spalding & Bros.

A GOOD source of additional income, in any town where tennis is played, is racket repairs and stringing. The bigger the town the bigger the trade, of course, and in large cities racket stringing can be a full-time job with firms like Wilson or Spalding.

How is this trade learned? Well, I can tell you how to string a racket right here, but only *doing* the job will make you efficient at it.

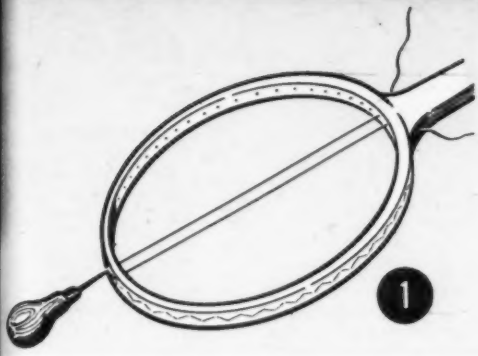
Stringing a racket takes the beginner about 90 minutes. When he has a little experience he can do the job in an hour and experts can whittle the time down to 30 minutes.

Before learning how to string a racket and about the limited amount of equipment necessary to do the work, you may be interested to know how much money you can make in this line of work.

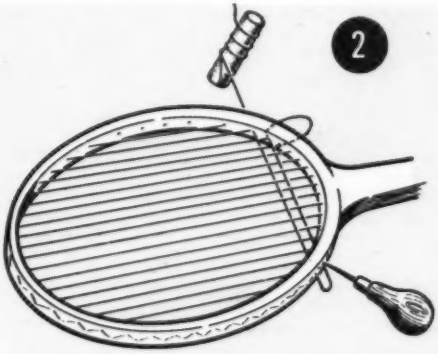
A set of nylon tennis strings costs the stringer $1.50; the current retail price for restringing is $6.50. Your profit: $5.00!

From every stringing job there will remain a few feet of string; with these ends repairs to a frayed racket can be made at no cost for material. The average stringer gets a dollar for "splicing" in one or two new lengths of nylon or gut strings. For repairs of more than two strings he asks an average of 25 cents for each additional string. Thus a patch job yields 100 per cent profit and four or five small jobs bring the stringer $6 to $10 for as little as an hour's work.

There are many ways of getting in on this profitable business. One is to contact department stores and ask to han-



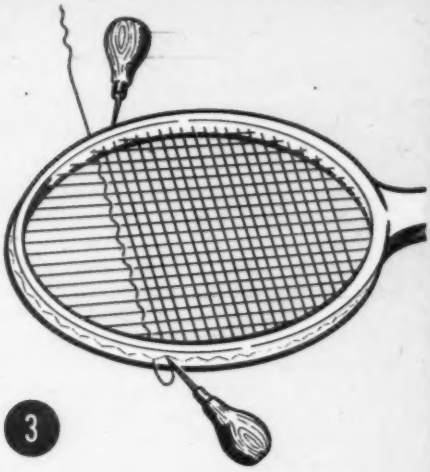
VERTICAL string enters at base of throat and is threaded through top center holes and out again at base. Ends are of equal length. Awl holds nylon firmly in place.



HORIZONTAL string starts at knot on the fifth string from center, loops out through frame and in at next hole, goes over and under verticals, then weaves back and forth.

dle their racket repair work. A second source is the sporting goods shops. Few of these have even a part-time stringer and welcome help from outside. Third, the athletic and country clubs offer a rich field of sales among members. This contact is best made through the Golf Pro or Club Manager.

A visit to the public parks will often pay dividends. Let the playground director know you are in the repair business and leave a list of prices on restringing with him. Another source is a small ad in the local newspaper and, of course, word-of-mouth and the recommendation of satisfied customers is always a great advertisement.



AWLS hold string taut at each new bend. A blunt awl is also used after string is woven through verticals to line it up with horizontals. Awls cost $.25 each.

The tools required are few and inexpensive. A vise to hold the tennis frame can be bought from E. P. Juneman Co. of Chicago (or any of the major sporting goods manufacturers like Wilson or Spalding, all of whom have offices in Chicago and most principal cities) at a cost of less than $10. It can be mounted with a few wood screws on your work bench or on a 4x4 extending from any sturdy support.

A set of four to six awls, which look like small ice picks, must be used to keep strings from slipping until the job is finished. Awls cost about 25 cents each, though many manufacturers supply them free with the purchase of a vise or sets of strings.

A dowel—the final tool needed—is a rubberized instrument about six inches long. Dowels are stocked by the same manufacturers and usually sell for a dollar.

With this equipment you are ready to learn the simple job of stringing a tennis frame.

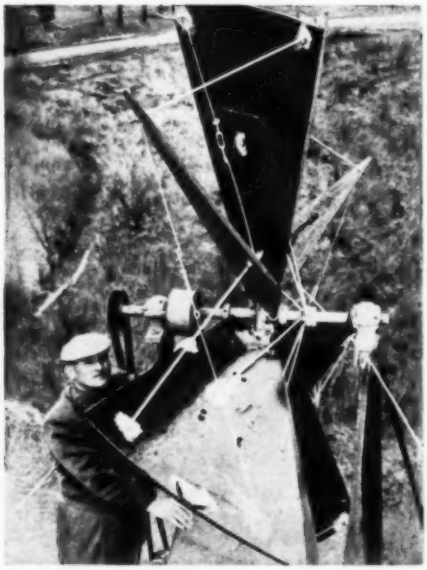
Place the racket in your vise and tighten the bolt holding the handle of the racket. Use a piece of felt or leather in the vise jaws to prevent damage to [*Continued on page* 162]

Home-Built Windmill

THERE'S a dilly of a windmill atop a knoll behind Joe Ule's home in the northern part of Ohio, 40 miles from Cleveland. Joe, a 56-year-old general contractor, put it there. It stands 90-ft. tall at present and will be 128 ft. high when the propeller blades are installed next year. Joe's been building his twirler for nine years now and expects to finish it within the next four or five years. The windmill has nine tiers. The wooden dome and connecting mechanisms weigh 18 tons, the concrete structure about 600 tons and the main shaft of the windmill five tons. This last is 50 ft. long and is made from a 140-year-old log of white oak rounded on a giant lathe, one of Joe's inventions, put together with railroad ties and base timbers 36 ft. long. Joe's windmill has about 50,000 cubic ft. of space—the most of any windmill in the world. •

90-FT. windmill was begun nine years ago, will take four or five more to complete.

100-YEAR-OLD millstones are worth more than $800 each, will be used to grind grain.



TAIL WHEEL atop windmill will keep main blades headed into wind by turning dome.

IT'S NEW

AIR SCOOTER does 25 mph on flat land, climbs ten per cent grade, has motor scooter mill.

ROCKING CHAIR lovers can now indulge in their favorite sport—sideways—as demonstrated at Chicago furniture show.

BALE-MASTER is English device. It totes neat 20-bale load. Five sliding prongs stack bales. They are held in place by closing side gates.

CONTINUED...

COLD GUY envies warm miss "sunning" herself via German bottle gas-powered infra-red lamp.

PORTABLE emergency oxygen unit dispenses hour's supply, weighs under two pounds and operates on facial contact. $27.

COLT AR-15 is new combat rifle. It fires .223-cal. or NATO 7.62mm bullets both semi-automatic and full at 720 rounds-per-minute. It weighs under six pounds with 20-round magazine.

AUSSIE BOOM driven by truck allows eight water skiers to learn art in shallow ditch without risk of drowning. Truck moves boom at up to 50 mph.

ERICOVOX is $300 Swedish phone operated by three control buttons. Incoming voice is heard through slotted base. User talks to phone as if speaking into a microphone.

COMPASS on unique heel of this Italian shoe comes in handy—in the event wearer loses her way. The compass design is also carried out on white leather of the shoe.

LOVERS of English motorcycles will like this good-looking Ariel Arrow. It goes 70 mph, gets 100 mpg, has gas tank inside pressed steel chassis.

PUSH-AWAY WRECKER FOR OUTER SPACE

An Original MI Design by FRANK TINSLEY

SINCE that fateful day in October 1957 when the *beep-beep* of Sputnik I ushered in the space age, more than 25 satellites of assorted sizes and shapes have been shot into orbit. Some of these were short-lived and, after a month or two of cosmic circling, fell back toward earth and were consumed in the atmosphere. The others are still up there, whirling aimlessly in space. Except for three or four U. S. vehicles which still signal back data, they are all dead hunks of machinery, some freighted with expended bat-

TOWBOAT (above) moves into orbit of dead satellite (left) and will lock into its rocket nozzle. Spacemen are shown attaching the tail clamps.

teries and electronic gear, some with the corpses of laboratory animals. If rumor can be believed, there may even be a trio of red-starred space capsules, one bearing the body of an intrepid Russian girl who gambled her life on being the first cosmic explorer—and lost!

During the next ten years, a program of 260 satellite and space probe launchings has been announced by the U. S. There is little doubt that the U.S.S.R. will counter with a similar quota, and other nations now getting into the act will contribute a few more. So it is quite possible that the close of the 1960s will see the Solar System cluttered up with extinct satellites and probes—some five or six hundred of them! To make matters worse, they will be occupying all the best circuits as, at present, we send our "birds" into optimum orbits.

With the pace of space travel steadily accelerating, these dangerous derelicts will have to be disposed of. It will not be an easy job. We can not just blow them up—an exploded satellite will continue in orbit as a cloud of debris, sometimes for a considerable period. The only solution will be to push the unwanted vehicles out of orbit or slow them down until their orbital balance of speed, mass and gravity is upset and they fall toward their host planet. This can only be done by a specialized machine—a sort of cosmic towboat or wrecker for outer space. In this article, MI shows a possible form of such a craft.

Operating exclusively in weightless, frictionless space, our towboat has no need for super-powered rockets. Its extended missions and the enormous distances involved indicate electro-particle propulsion as the most economical drive system. And as this requires a constant supply of electric power, an atomic reactor is the logical source. It is simple, long-lived and compact enough to fit into our tight towboat geometry. We have therefore selected a combination of the atomic reactor to generate heat, the thermionic converter to convert that heat into electric current and ion propulsion to translate the current into thrust.

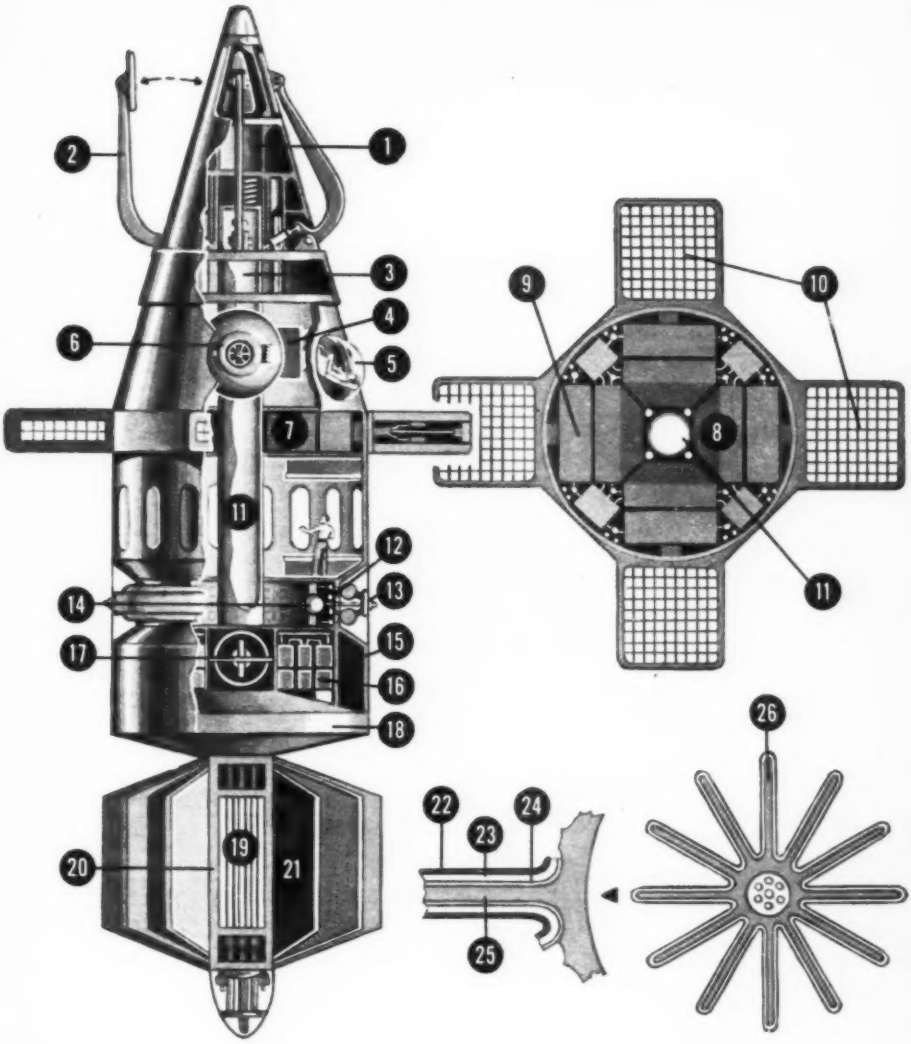
In MI's towboat, the thermionic converter is designed in the form of 12 large fins radiating outward from a central reactor. The latter is jacketed with light shielding which picks up the heat of fission and carries it out through the core of each fin. The hot plates of the battery are mounted on the faces of this core. Cold plates, forming the outer skin of the fins, are exposed to the frigid vacuum of space. The gap between is filled with cesium vapor. Reaction speed, moderated by the customary graphite rods, is controlled by a mechanism in the after end of the pile. This withdraws the rods rearward. At the forward end of the reactor, a heavy circular shield absorbs harmful radiation and envelops the towboat hull and crew in a safe "radiation shadow."

Alternating current, generated by the thermionic converter, passes around the shield and into banks of storage batteries. From these, it is fed to the propulsion system and auxiliary appliances. Among the latter is a gyro stabilizer which controls the craft's attitudes in flight.

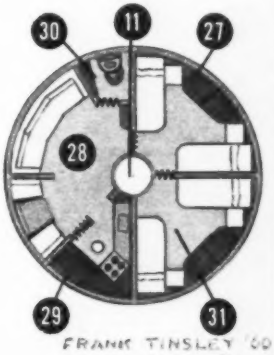
Ion propulsion engines, proposed some years ago by the French physicists, Drs. Irene and Eugen Saenger, are currently under development in several U. S. research labs. While their thrust potentials will be tiny by chemical rocket standards, they are ample in frictionless space and, unlike today's short lived rockets, will be continuous over the entire trip. It has been estimated that a ten-ton vehicle subjected to a ten-pound thrust for a month's time, will gradually accelerate to 25,000 mph.

During flight, the vehicle will build up its speed to the half-way point, then reverse its engines to brake it for the second half. It will thus arrive at its destination at the same rate at which it started. In the case of our towboat, this can be preselected to match the orbital speed of the satellite it intends to pick up. The towboat's four ion engines have a forward propulsion area of 400 square feet, an equal area for reverse and smaller top and side areas for maneuvering.

In pick-up operations, the towboat moves into orbit behind its target, slowly closing the gap between them. When within [*Continued on page* 166]

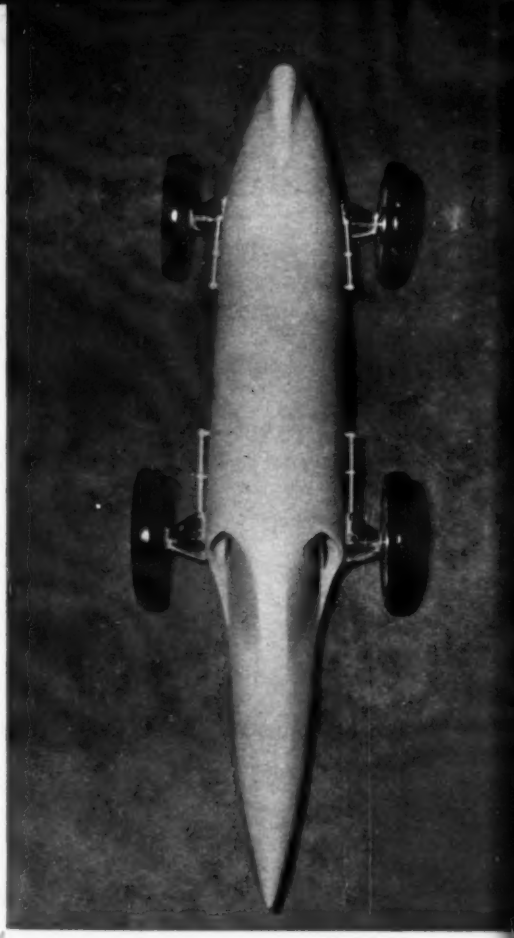


TOWBOAT DIAGRAM shows: 1. the nozzle contact cone; 2. friction clamps; 3. shock absorber ring and tube; 4. computer; 5. pilot bubble; 6. hatch; 7. propulsion section including (8) guidance gear, (9) ion converters, (10) ion cells and (11) central access tube. 12. Hydroponic garden tubes; 13. algae drying tubes; 14. food collection flasks; 15. Water tanks; 16. storage batteries; 17. attitude control gyro; 18. radiation shield casting radiation-free shadow; 19. atomic core; 20. transfer shielding; 21. thermionic converters. Section of fin shows (22) cold plate, (23) cesium vapor, (24) hot plate, (25) heat transfer from shielding. 26. Cross-section of fin; 27. living quarters; 28. lounge; 29. galley; 30. lavatory; and 31. sleeping cabins.



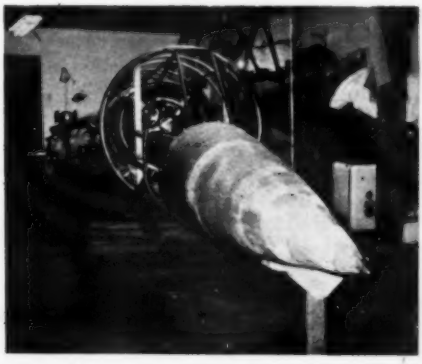
WILL THIS CAR BREAK 500 mph?

HERE'S the jet-powered car that Nathan Ostich, a Los Angeles, Calif. physician is building to beat the record of 394.2 mph that was set by England's John Cobb at Bonneville Salt Flats, Utah, in 1947. Dr. Ostich hopes to hit 500 mph and over at Bonneville in August. The tires and wheels designed for the car by Firestone Tire and Rubber Co. are capable of carrying the machine at a speed of 600 mph. The General Electric turbojet power plant is of the type used in B-36 bombers. Disc brakes on each of the all-aluminum wheels and a ribbon parachute will be used to safely slow the car to a stop. •



SCALE MODEL. The real racer will be 28.5 feet long and have a four-foot diameter.

DOCTOR'S BUGGY. Physician Nathan Ostich holds a miniature of his turbojet racer.



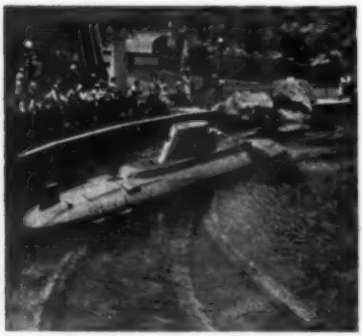
POINTED NOSE, cylindrical shape assures that 500-mph auto won't fly like a plane.

MIMI

THE grateful, happy look on that fishy face shows Mr. Fish's sincere gratitude to our pretty product tester for taking off all those nasty scales the easy way. The Dremel Electric Fish Scaler comes complete with motor and attachments for sharpening hooks and knives and for polishing up your tackle. Price is $30. Kit without motor, for use with any electric drill, costs $14. The reason our lovely MIMI is not all be-sequined with smelly scales is that the guard over the scaler keeps scales from flying. Flexible shaft works with motor on table or hanging from a nail. You can use this tidy worker at the sink, away from evening mosquitoes. Dremel Manufacturing Co., Racine, Wis.

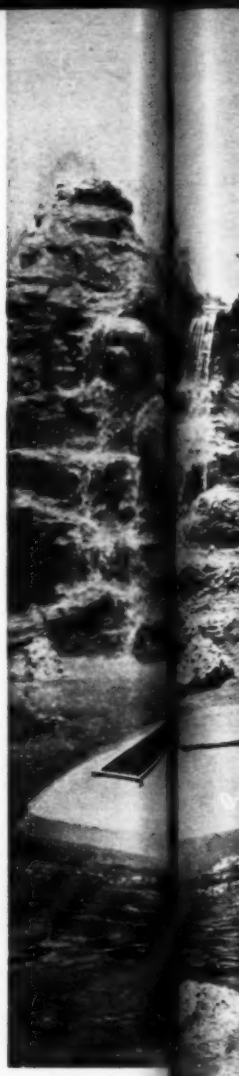
SUBMARINE ON RAILS

ONE of Disneyland's eight submarines eases through a cascading waterfall in the photo at right. Oceanic explorers step aboard the air-conditioned subs—each one is 56 feet long with viewing portholes for 38 passengers—for a trip through "liquid space" that takes them under the Polar Ice Cap; past the graveyard of sunken ships; through the legendary Lost Continent of Atlantis and the Mermaid Lagoon; and alongside a sad 80-foot sea serpent. The subs actually ride on rails and their conning towers are never underwater. Passengers hear the captain's commands and see such sights as deep sea divers, coral lagoons, various fish and a fiery underwater earthquake as they leave Atlantis. •

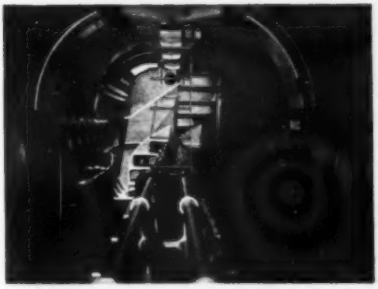


SUB VOYAGE "beneath the Seven Seas" cost $2,500,000 to build. Boats ride on rails which are visible in water.

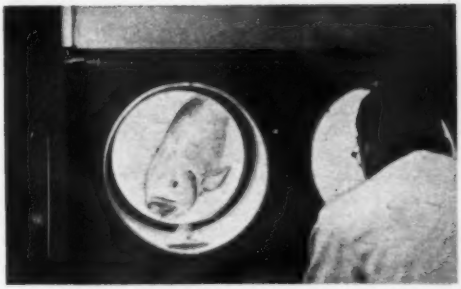
DOWN THE HATCH go passengers. Lower half of boat is submerged; the conning tower is not.



SIGHTSEERS view wonders of the deep through 38 12-inch portholes. Huge filtering system keeps water crystal clear at all times for voyagers probing "liquid space" realm.



DISNEY'S navy submersibles have seats for passengers and are all air-conditioned.



FLUORESCENT fish, sunken treasure and giant squid are among wonders of deep.

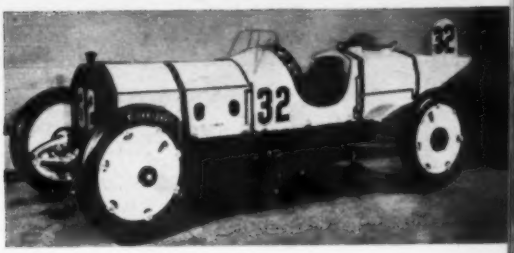
TOURISTS' GUIDE TO
ANTIQUE CAR MUSEUMS

DO antique autos send a tremor down your spine? If they do, you have a perfect excuse to take your family to one of the many antique auto museums that are open to the public this summer. These museums are located from New York to California and chances are good that there are several of them in your vacation area.

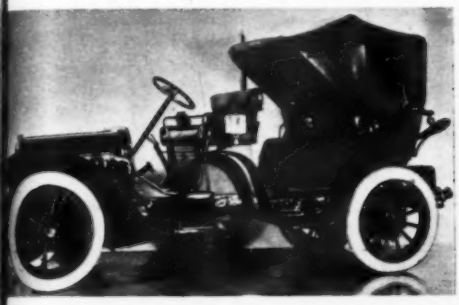
If you visit Pottstown, Pa. for example, you will enjoy the William Pollock Collection. Here you can examine more than 50 antique cars in the same condition as when they were new. The

POTTSTOWN, PA. William Pollock Collection stars 1891 Peugeot V-2, said to be oldest car in running condition in U.S.

RAPID CITY, S. D. 1905 Stanley Steamer is displayed at Horseless Carriage Museum.



SPEEDWAY, IND. 1911 Marmon at Indianapolis Speedway Museum, one of 12 cars.

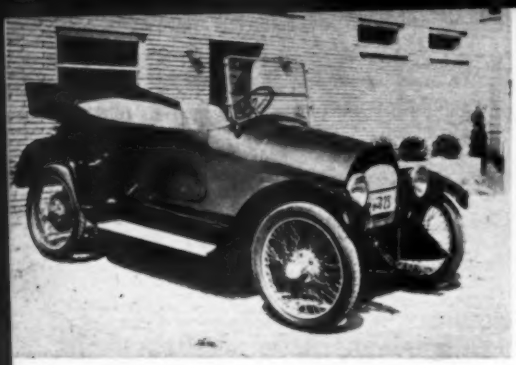


DEARBORN, MICH. 1904 Peerless is one of more than 175 cars at Henry Ford Museum.

PETERBOROUGH, N. H. has this 1899 Knox displayed. Goyette Museum of Americana.

SOUTHAMPTON, N. Y. 1900 Locomobile, displayed at Long Island Auto Museum.

PRINCETON, ILL. The Bureau County Museum of Historic Autos. Car is 1912 Krit.



PIGEON FORGE, TENN. 1919 Overland model 90 at Smoky Mountain Car Museum.

ATLANTA, GA. 1913 Carnation at Atlanta Antique Auto Museum is only known model.

main attraction is an 1891 Peugeot, claimed to be the oldest running car in the U. S. This ancient French buggy has a Daimler-Benz six-hp, two-cylinder engine.

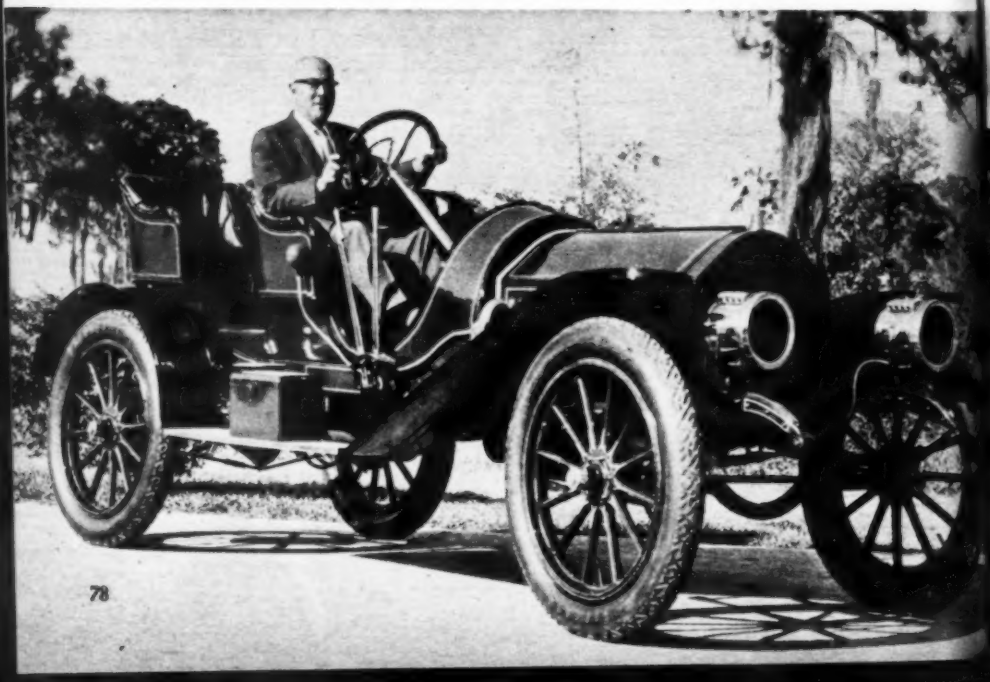
The Indianapolis Motor Speedway Museum has 12 famous cars on display. One is the six-cylinder Marmon Wasp which Ray Harroun drove to victory at the first 500-mile race on May 30, 1911, at an average 74.59 mph. Speedway prexy Tony Hulman also has assembled many photos and trophies for viewers.

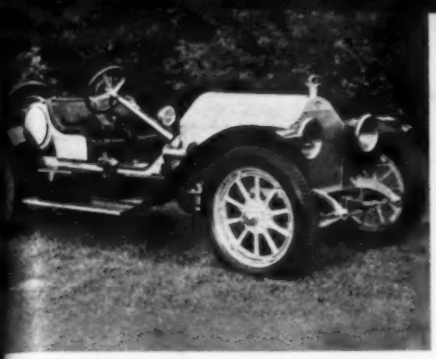
The Swigart Museum in Huntingdon, Pa., aside from its antique autos, also has the largest display of auto emblems in existence. There is also an exhibit of U. S. and foreign license plates.

Then there is the magnificent Henry Ford Museum in Dearborn, Mich., which offers a dazzling display of old-time cars that mark the growth of our automotive industry as it is today.

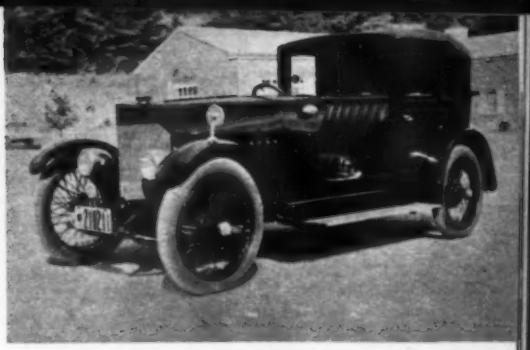
Admission to the various museums may be free or range up to about $1.50. Many are only 50 cents and children are usually admitted for half price. We guarantee that you'll enjoy yourself. •

SARASOTA, FLA. Horn's Cars of Yesterday has 1909 Sterling, over 70 other antique cars.

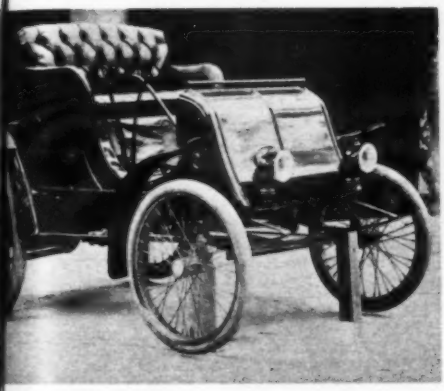




CAMDENTON, MO. 1914 Stutz Bearcat is in 40-car display at Kelsey's Antique Cars.

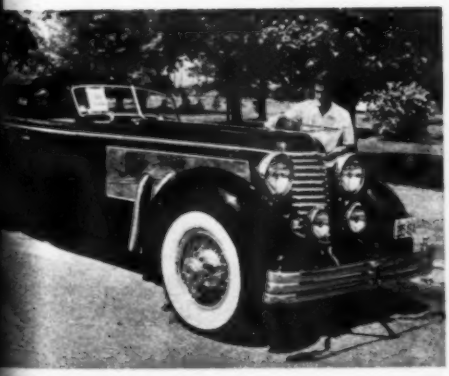


HUNTINGDON, PA. The Swigart Museum has 1916 Scripps Booth in car display.

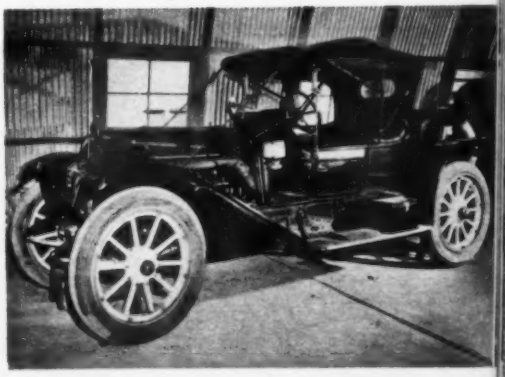


LOS ANGELES, CALIF. 1900 Winton, one-cylinder job at Los Angeles County Museum.

MINDEN, NEB. Harold Warp's Pioneer Village has 1905 Buick among many cars.



NATURAL BRIDGE, VA. 1940 Duesenberg, Pettit's Antique Motoring Memories show.



SOUTHINGTON, CONN. Powers Automotive Museum features this 1912 Pope Hartford.

MONEY MAKING IDEA

HE TURNS BACKYARDS INTO FAIRWAYS

RETURNO consists of patented 15-foot "stabilized cord" attached to golf ball, wooden anchor block.

ANCHOR BLOCK is secured by two five-inch spikes driven into the ground at angles.

THE urge to swat a golf ball in the backyard can become quite strong to an avid devotee of the game. When it hit Nat Cabot of East Meadow, N. Y., he did something about it. He invented Returno, a self-retrieving ball device which safely turns any lawn into a fairway in less than a minute, as you can see in the photo above.

It was the coffee cups swinging from hooks on the kitchen shelves that gave Nat his inspiration. He was home at the time, conva- [*Continued on page* 165]

RENAULT beach wagon (on cover) is a 4CV that is fitted with special body.

JOLLY is the same as Fiat 600 except for wicker seats, canopy, stripped body.

JEEP SURREY sports a gay canopy, seat covers in matched candy-stripe decor.

BEACH BUGGIES

You know at first glance that these jaunty little cars are built for fun on summer's sunny days.

IF you don't dash down to the water in a beach buggy this year, you're just not with it, Dad. The beach buggy is real cool and designed for summertime activities.

A beach buggy is a little vehicle in a class by itself. It's a gay, doorless car with a jaunty canopy for a roof and seats for four sun-worshippers. It's a relatively new phenomenon on the American market and you'll know at first glance that it's built for fun.

The Jeep Surrey is the only U. S. rig in this class. It is decked out in delicate pink and pastel blue and green. It sports a vinyl-coated fringe top and seats decorated in candy-striped colors that match the body. The Surrey costs $1,650.

Renault's beach wagon is basically a 4CV job with a special body. It has a remov-

RENAULT totes up to four funsters on its wicker seats. The economical beach buggy will average better than 40 mpg on road.

SPACE for beer, food, luggage, etc., is under hood up front.

REAR ENGINE is four-cylinder job with top speed of 70 mph.

SUNSHADE canopy is installed or removed in a jiffy. Four sturdy poles support it.

JOLLY 600 is dashing Italian beach buggy with a removable fringed canopy. The jazzy job seats four passengers.

FIAT makes two beach buggy models: the 600 shown here, smaller 500.

able fringe top and wicker seats. The French-made beach buggy is $1,895.

Fiat's Jolly also has a removable top, wicker seats and the same dimensions and engine as the 600. It costs $1,906. The 500 model goes for $1,760.

These snappy low-cost, high economy rigs are ideal for short trips to and from town, beach, golf course, picnics, etc. They offer perfect transportation for summer's sunny days. •

SPARE is housed under the hood. Jolly's trunk space.

SIMPLICITY is keynote of dash. Instruments, big storage bin.

REAR MILL gets over 40 mpg, does 65 on four cylinders.

OUTDOORS
with
W. Scott Duncan

CORRECT TACKLE FOR SURFING

THE man who heeds the call of the surf is one of the most devoted anglers in the realm of fishing. He would no more think of dropping a line from a boat than would a dry fly purist be caught dead with a worm or minnow.

All game fish fight harder in a surf than they do farther out at sea. If the surf caster has the right lures and tackle, he can have a finny ball. This, however, is a big *if* that the beginner usually can't hurdle. He can be completely confused by the vast array of saltwater tackle that confronts him when he buys an outfit. [*Continued on page* 167]

BRIGHT IDEA AWARD
MECHANIX ILLUSTRATED

ELECTRIC LUNCHBOX

LUNCHBOX works on standard 110-volt house current. Food is heated in seven minutes when unit is plugged in.

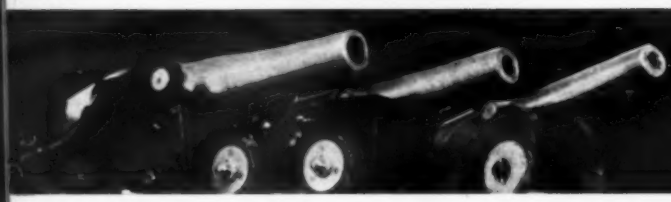
THERMETTE is a patented electric lunchbox for the guy who enjoys a hot meal on the job. The handy all-aluminum lunchbox heats such pre-cooked foods as steaks, chops, vegetables, etc., in seven minutes. Thermette has an outlet which plugs into a regular 110-volt house current circuit. A die-cast aluminum tray does the heating chores. Anyone for a hot hero sandwich? Price is $12. Thermette Electric Lunchbox Distributors, Box 1093, San Jose 8, Calif. •

TRAY heats food and there is space for a Thermos bottle. Sturdy and durable lunchbox is all-aluminum.

WIN $50

MI will award $50 each month to the first person who tells us of a new and useful gadget that is patented and in production. Manufacturers are also eligible for this award. Pictures and a description should be sent to Bright Ideas Editor, Mechanix Illustrated, 67 West 44th Street, New York 36, N. Y.

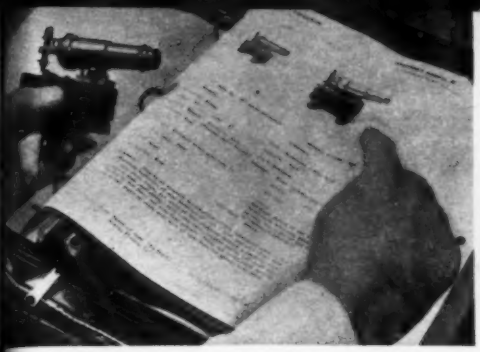
HE OWNS 300



CANNON

HAMPTON P. Howell, Jr., a Westhampton Beach, N. Y., stockbroker, belongs to a fraternity of collectors who call themselves cannon hunters. While he has a few real guns that can shoot up to a six-pound ball, most of his pieces are models. He does his hunting in gun dealers' shops and junk shops; once found a real Civil War gun in a neighbor's barn. The oldest type of gun represented by his models is the bombard, used in the 1400s; latest is a WW II howitzer. •

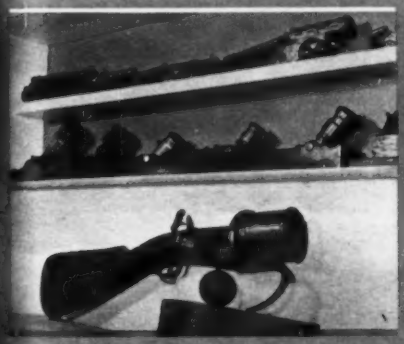
FIELD PIECE, 1840, carries tiny tools iron-strapped to its carriage.



INDEX describes each gun in collection. Page on this one says it's a naval carronade of type used in broadside batteries in 18th-19th centuries, gives history of model.

UNMOUNTED CANNON that may eventually be mounted or put to some novel or decorative use. Howell collects "big guns" almost exclusively, has few pistols, muskets.

SWIVEL CANNON used on men-of-war in 18th-19th centuries form a special group.



GRENADE LAUNCHER, Dutch, 17th century, flintlock. Hook is a rare feature.

1. SIEGE GUN, 1651; 2. Highly-decorated gun, 1700s; 3. Model mortar, Napoleonic.

the BUICK

"Solid-gold performance," reports Tom of this roomy and comfortable car which recently ran 10,000 miles in less than 5,000 minutes, averaging 120-plus mph!

By Tom McCahill

GRILLE is changed, gone are the canted headlights of '59, but styling is similar.

McMICHAEL'S absent this month so Uncle Tom tested trunk. Verdict: "Ample room."

BUICK corners well, rides smoothly over rough roads. "handles in traffic like a bantamweight," says Tom.

AS Aphrodite Finnegan, the great Lapland philosopher, once said, "Men and monkeys move in strange ways." So do automobile companies. And thereby, like the monkeys, hangs a tale.

I first became interested in the 1960 Buicks when an Invicta sedan made a fantastic endurance run at the Daytona International Speedway in January. Buick rented the track and hired some top NASCAR drivers to find out just how much punishment the new cars could really take.

The test car finally selected was as stock as hair on a walrus when it arrived at Daytona. There, NASCAR race men gave it a real tune-up (or, as they say along the pit wall, "Some top setup

TEST CAR SPECS

MODEL TESTED: **1960 Buick Invicta two-door hardtop**

ENGINE: **V8** cyls; **401** cubic ins; **325** brake hp; **445** ft-lbs max torque; **10.25** to 1 compression ratio. Bore **4.19** ins; stroke **3.64** ins. Fuel required: Premium. Standard axle ratio: **3.23.** Wheelbase **123** ins; length **217.9** ins; height **57.2** ins; width **80.0** ins; front tread **62.04** ins; rear tread **60** ins. Weight **4,336** lbs.

Gas tank capacity **20** gals. Turning circle diameter **44** ft. Tire size **7.60X15.**

PRICE (without optionals): **$3,447.**

PERFORMANCE: **0-30** mph, **3.8** secs; **0-60** mph, **8.9** secs; **40-60** mph, **4.8** secs. Top speed **120-plus** mph, depending on tune. All times recorded on corrected speedometer.

CHASE CAR had a protective bumper and an extending tube apparatus to refuel the endurance-run Buick.

BACK SEAT held 200-gallon pressure tank to transfer the fuel.

boys made sure the car was the way the factory meant to make it in the first place"). Before anyone gets any wrong ideas, this is standard practice for stock-car competition and doesn't mean altering the basic specifications nor adding any special equipment. What the boys really do, in essence, is to loosen her up where expansion might cause a breakdown. They make sure everything is screwed together right—something that is not always possible on a production line.

A few test runs after the Buick had been set-up showed that it could go for a number of miles without overheating at speeds close to 130 mph. At this high speed, gas consumption became a major factor. The car was getting between five to six miles to the gallon, which meant a pit stop for fuel more often than once an hour and would have dug deep into the car's average speed.

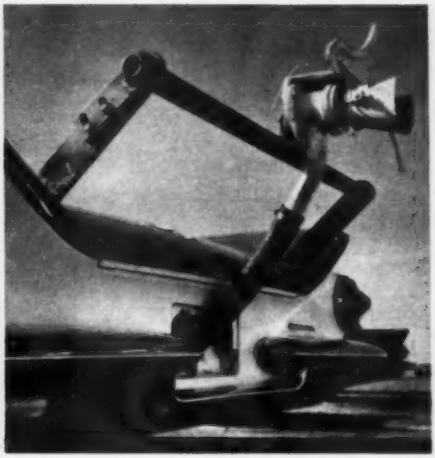
To overcome this, Bob Spinner and some other top Buick engineers made a "refueling car" out of another Invicta sedan. The rear seats were yanked out and a 200-gallon pressure tank installed. Then came the problem of transferring the fuel to the test car. The Buick boys developed a pressure system and a fueling pipe activated by a trigger that would shoot exactly 15 gallons of fuel into the test car in four and a half seconds! A target-like female receiver was built into the rear deck of the test car and a pipe from this led right into the main fuel tank. The fueling pipe extended about four feet in front of the refueling car on the driver's side.

It took several days of practice for the test drivers to hit the bulls-eye every time and with the least possible fuss. It was sort of like pig-sticking—but at speeds of more than 120 mph. This became particularly tough at night when the track was blacker than the inside of a dragon's gizzard. Then, hitting the receiving hole with the thin, little refueling pipe became almost as difficult as shooting down a 600-mph jet with a .22.

There were seven drivers on the team, headed by Fireball Roberts, and all seven took turns driving the two cars. For better than three-and-a-half days the test car was refueled every 45 minutes at high speed. It came into the pits approximately every four hours for a driver change and tire check. I rode in the fuel car with Fireball Roberts, taking photos. When I shot the refueling pix you see on these pages, we were doing exactly 123 mph.

What did Buick accomplish in this en-

DRIVER Fireball Roberts shows Tom novel pipe which extended six ft. to refuel Buick.



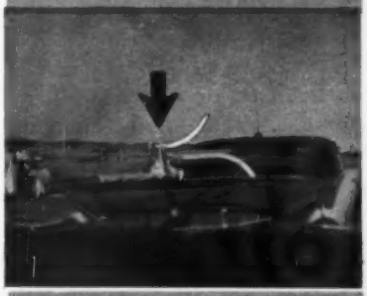
FUEL receiver connection, at the rear of the endurance-run car, emptied into gas tank.

durance run? The test car went 10,000 miles in less than 5,000 minutes, *averaging 120.186 mph for the whole route!* But here's what I meant in the beginning when I said that men, monkeys and automobile companies move in strange ways. Due to the Automobile Manufacturers' Association ruling of 1957, Buick was ordered by top General Motors brass not to publicize this feat in any way at all. No advertising, not even press releases. You'll have to admit this is a pretty tough handicap when you've just shot at the moon and scored a bull's-eye.

This Buick run, which I spent many hours observing, was a terrific accomplishment. Buick had a rather bad sales year in '59 and, so far, is not burning up the sales road in 1960. It could use this publicity and I, for one, believe it would help sell a lot of cars. But strange are the ways of corporations. Some companies spend millions of dollars to plug an adjustable seat or new door opening but keep quiet about a solid-gold achievement such as this performance run, which means much more.

Well, what kind of a car is the Invicta, aside from being a record-breaking endurance [*Continued on page* 160]

TUBE of chase car slowly extends toward the Buick test car.



CONNECTION made at 123 mph! Transfer took six seconds.

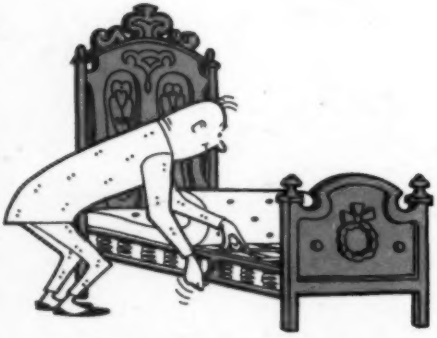
EDIBLE candles of candy or cake that will glaze cake when they melt, eliminate melted wax. Brent Lyons, Middletown, N. Y.

MUSIC-to-munch-by would come from transistor radio, aerial that are built into a lunch box. John Guinness, Hopewell, N. J.

INVENTIONS WANTED!

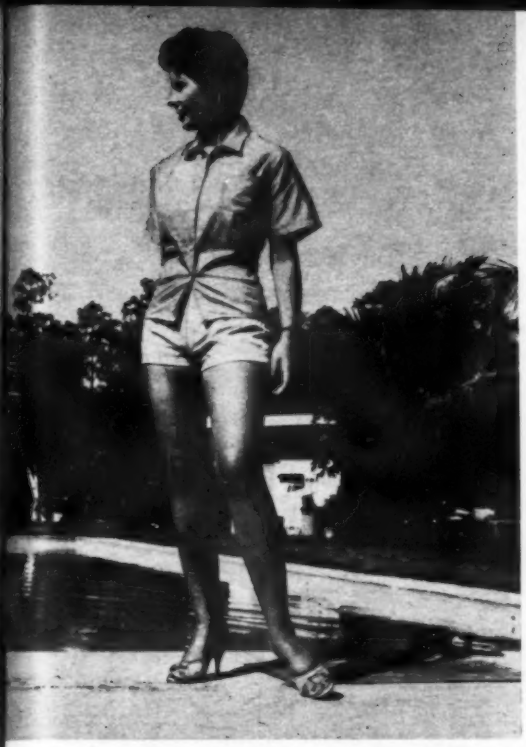
Is there a gadget you think should be invented? If so, send its description on a postcard to Inventions Wanted Editor, MECHANIX ILLUSTRATED, 67 West 44th St., New York 36, N. Y. Each one printed will be awarded $5. Entries not selected cannot be acknowledged or returned.

LOOSE-LEAF notebook binder with sliding rings to accommodate any size paper. Glenn Stevenson, North Burnaby, B. C., Canada.



BED SPRINGS which could be tightened or loosened and thus adjusted from soft to hard. Ronn Greider, Fountain City, Tenn.

BATTERY-POWERED lawn mower that could be recharged by plugging into ordinary house current. Mrs. John McBride, Seattle.



PATENTED Floater Shirt is made of water-sealing cotton fabric that holds air when it's wet.

LIFESAVER SHIRT

THE Floater Shirt is really a lifesaver. It automatically inflates within four seconds after you hit the water. A small inside pocket holds a chemical package that releases a harmless gas when the shirt comes into contact with the water. The shirt will keep you afloat for 45 minutes. You can also inflate it via a mouth valve in the front pocket.

The Floater Shirt comes in all sizes. It is made by the Hudson Mfg. Co., 477 Riverside Ave., Jacksonville, Fla. Men's Floater Shirts are $9.95. •

WOMAN OVERBOARD! Shirt operates automatically, even if wearer is injured or is knocked out.

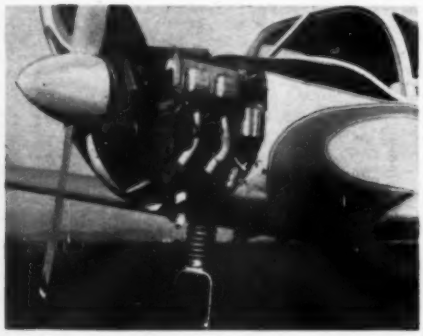
FOUR SECONDS later shirt is supporting its wearer. Rain will not inflate the shirt; it must be saturated.

INFLATING chemical is 39 cents and a new packet is needed after each immersion of the Floater Shirt.

V-TAIL job has center control stick, two throttles for its dual control arrangement.

MEET THE
QUEEN BEE

QUEEN BEE is a prototype glass fiber and metal craft developed by Bee Aviation of San Diego, Calif. The plane has a 32-foot wingspan and a length of 21 feet ten inches. It totes its fuel in two 20-gallon wingtip tanks. The estimated cost will be about $10,000. •



LYCOMING 180-hp engine gives craft 600-mile cruising range, 150-mph top speed.

QUEEN BEE grosses 2,300 pounds with four passengers, baggage, 40 gallons of fuel.

SPECIAL SECTION . . .

Outdoor Fun

By Harvey Gardner

OUTDOOR FUN is the MI term for what is usually called Outdoor Living, with just a touch of frenzy thrown in. Games that interest your athletic friends—without completely destroying the interest of your 97-lb. weakling buddies—make your yard, garden or patio an amusing place for all.

Tether ball is a good example; it consists of a pole with a rubber

WADING POOL, plastic and aluminum, assembles easily. $50-$100.

Prest-Wheel, Inc., Oxford, Mass.

GLASS FIBER DONKEY on spring set in concrete typifies new outdoor toys. This plaything costs Daddy $75.

Game Time, Inc., Plymouth, Mich.

MEXICAN FLASHLIGHT, quaint, authentic terra-cotta, beams the light, fends off breeze. $5.95.

Candles Of The Month Club, Box 6552, Houston 5, Texas

ball attached to the top by a cord; each player tries to wind the cord around the pole. Abercrombie and Fitch, New York, N. Y., (hereinafter called A&F) sells it for $12.95 but I bet a smart country boy could make one for less. Another good thing being featured in toy departments these days is a plastic croquet set with which the kids can safely play polo, hockey or the like—as they would anyway. I can't seriously suggest real polo because so many people are now allergic to horses—and also because polo takes a lot

PLASTIC WEBBING of new polypropylene resists sun and rain indefinitely.

Reeves Brothers, Inc., 1071 6th Ave., New York 18, N. Y.

SUREFIRE LIGHTER plugs into house current, starts charcoal fire without fuss or fumes. $6.

Phoenix Consumer Prods., Inc., 4901 Perkins Avenue, Cleveland, Ohio

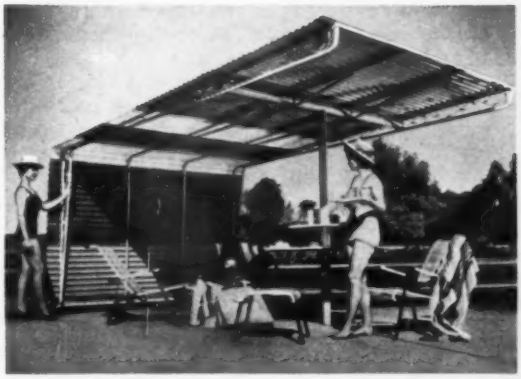
OMNIPRESENT small inflatable pool keeps babies endlessly wet and happy.

COBWEB chair from France has a sturdy frame that folds into a hoop, seat of elasticized nylon that fits everyone "just right" like Goldilock's famous seat. Great for bouncing. Weatherproof. Price is $25.

Hammacher Schlemmer, 145 E. 57th St., New York 22, N. Y.

of room. Bocci, or turf bowling, does not; you play it on any bit of turf and for easy outdoor living that's the kind of low-maintenance game to have. A&F has two bocci sets —one for $32.50 and one for $12.

Chairs, chaises, air mattresses, hammocks and those stay-out wooden furnishings that can take the elements are still what they were. But for keeping mind at rest while you rest the body they now have a portable playpen called Porta-Yard—a circular extension gate that closes up into a one-arm bundle.



REVOLVING SHADE fends off the sun all day. $440.

Rainbow Enterprises, 1467 E. Indian School Rd., Phoenix, Ariz.

CHILDREN'S TABLE with umbrella has four seats attached. It also serves many adult purposes. $23.

Kusan, Inc., 3206 Belmont Blvd., Nashville, Tenn.

MOBILE cooker lets you grill, roast, barbecue or "rotiss" in or out. $300.

Hotpoint, 5600 W. Taylor, Chicago 44, Ill.

You can easily get to Junior before he can fight his way out of it and you can take it wherever you go with him. $9.95 at Hammacher Schlemmer, 145 E. 57th St., New York, N. Y.

A very nice thing to have out there in Funland is something to keep food and drink cold while you enjoy the heat. A Skotch container of some sort first comes to mind but there are other makes, such as the Wayfarer Samovar Cooler made by Standard Can Corp., which has not only a bale to carry it by but its own folding legs to stand on—very handy where table surface is precious. The stuff to use as a coolant is obviously ice, wet or dry, or one of the canned refrigerants such as Zer-O-Ice. Zer-O-Ice comes in a can and stays in the can—you put it in your freezer compartment to freeze the stuff inside, then put the can in with whatever you want kept cold. A quart can of Zer-O-Ice costs you $.98.

Sooner or later there [*Continued on* page 156]

JELLIED KINDLING in a tube burns ten minutes, can't explode.

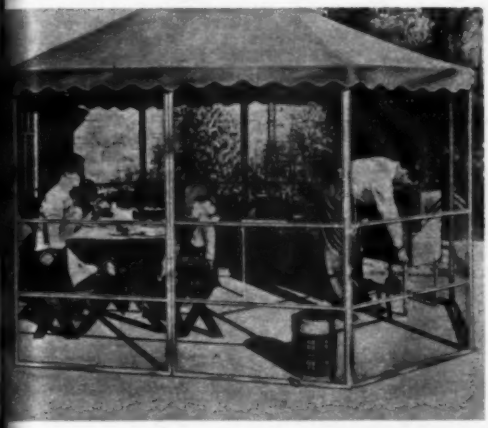
National Distributors, Inc., 204 N. Market, Wichita, Kan.

OUTDOOR SPEAKER brings music wherever you go from hi-fi, tape recorder, radio. $9.

Party-Q Corp., 601 W. 26th St., New York, N. Y.

OUTDOOR RADIO, a portable transistor job, receives on standard and short wave. $75.

Channel Master Corp., Ellenville, N. Y.



PORANDA provides outdoor comfort when the mosquitoes are humming. $230, $350.

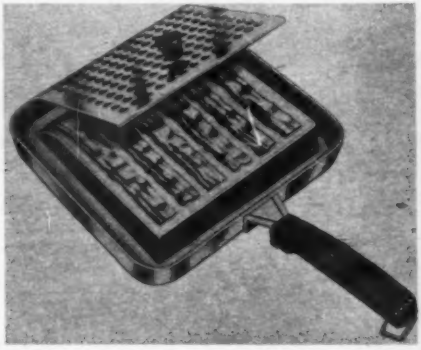
Hammacher Schlemmer, 145 E. 57th St., New York, N. Y.

DISPENSIT keeps 2¼ gals. of fluid hot or cold for hours. Recessed dispenser. $30.

Abercrombie & Fitch, Madison Ave. at 45th St., New York, N. Y.

TWIN-GRILL, simple, adjustable, for patio or living room fireplace. Cast iron. $20.

Hammacher Schlemmer, 145 E. 57th St., New York, N. Y.



GRILL-IT bacon grill, good indoors or out: no turning or draining is needed. $4.95.

Hammacher Schlemmer, 145 E. 57th St., New York, N. Y.

BACK-YARD SWIMMING

Diving, swimming and wading can be enjoyed by all ages in this

By Peter Whittall

POOL prices range from $5 for waders to elaborate $5,000 installations. The back-yard swimming pool pictured here falls inexpensively between these two extremes. The pool itself costs $300, the filtering equipment $200. So the complete installation will run about $500.

This pool is three feet deep, 20 feet in diameter and holds 5,000 gallons of water. These dimensions allow you to shallow-dive into it and to swim around to your heart's content. And it accommodates a surprisingly large number of sun-parched youngsters.

So much for the social aspects. The legal aspects are these: you pay more

SPREAD two or three inches of sand over level pool area, gently wet it down, then roll smooth.

SIDES OF POOL are tempered Masonite sheets fastened with cadmium-plated wing nuts and bolts.

TRENCH across bottom of tank is for plastic pipe that delivers filtered water back into the pool.

INTERLOCKING stanchions of galvanized steel girdle the pool and serve to reinforce the sides.

POOL

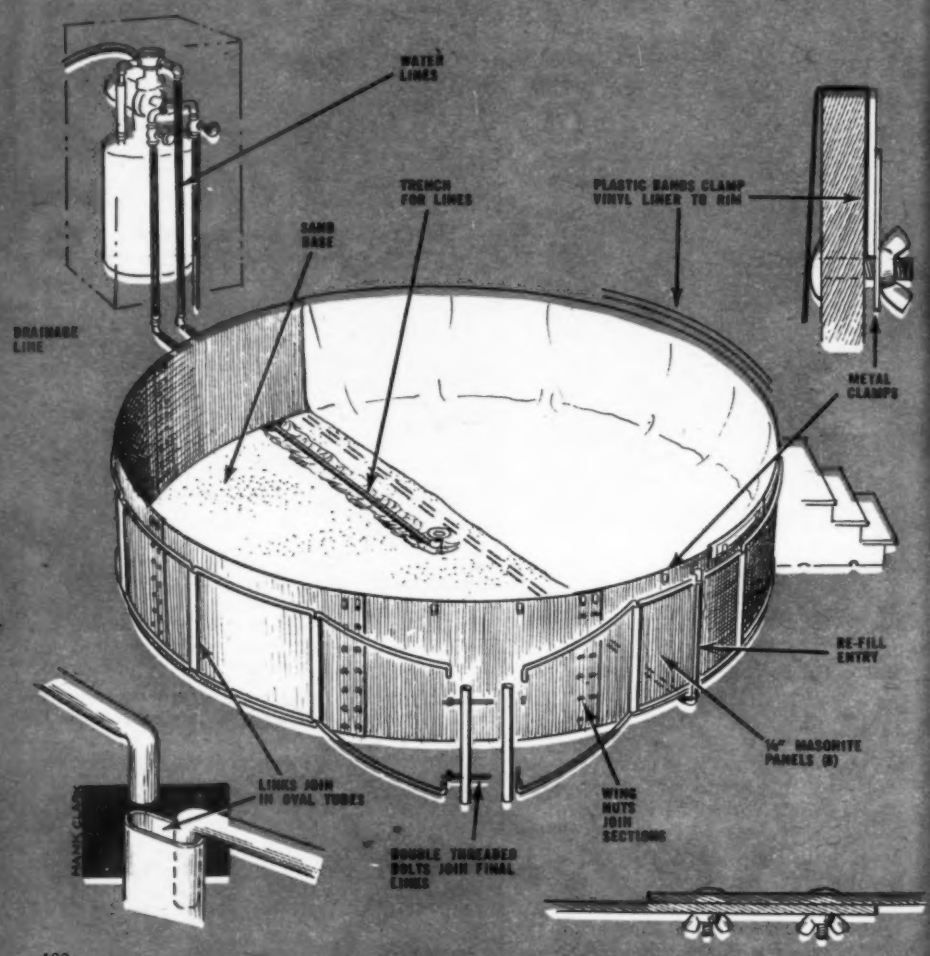
sturdy 5,000-gallon pool.

in taxes (on a higher assessment) if you have an in-the-ground pool instead of a ground-surface pool such as this. And a full-sized pool in my area must be fenced in to keep children out during "No Swimming" hours, and supervised when it's open. Since this tank is really just a king-sized wading pool, it did not have to be

fenced in *or* supervised, although I did both for my own peace of mind. I ran a four-foot-high barrier of chicken wire all around the pool and put on a gate that could be kept locked. The cost of this was only $10.

Since it would require more than 30 hours to fill this pool with a garden hose, I prevailed upon our local volunteer fire department to come 'round with the pumper when they were off duty. They filled it in less than an hour with water from a nearby pond. The filter cleared the pond water of algae and fish odors, mud and June bugs and the water was pure and crystal clear the next morning, and remained so all season. Occasionally I'd have to add an inch or two of water after a very hot or splashy day so that the leaf and bug skimmer would float off unwanted debris into the filter trap.

Be sure to get a chlorine test kit and count the drops of the reactor fluid it



TWO BOLTS draw adjacent stanchions together and tighten "belt" around the pool.

POLYETHELENE LINER on bottom and sides of pool is held to rim by plastic molding.

MEMBERS of local fire brigade fill pool with water; the job took less than an hour.

WASTE WATER may be utilized for shrubs if the waste pipe is kept short, as shown.

takes to change the pool water in the test tube from deep purple to clear. Then check the ready-reckoner chart on the test-kit box to tell how many chlorine tablets are needed in the filter. If the weather stays hot day after day, algae may develop and turn the water green and cloudy. If this happens, get a pound of copper sulphate from the drugstore and put it in the filter. The Bluestone killed the algae overnight, but I had to sprinkle a pound of powdered alum over the top of the water in the pool to precipitate the dead algae scum to the bottom of the pool where it was then pumped out by the filter. By moving the filter lever to Back Wash position, all the filtered waste is flushed out of the filter in less than a minute at a loss of only ten gallons of water. An underwater vacuum cleaner accessory can also be connected to the filter.

Altogether I have found this 5,000-gallon back-yard swimming pool less trouble and work than the big inflatable wading pool we formerly had. Yessir, I'm all for the big, moderately priced pool. And I think you'll agree with me the first time you take a dip in one of these spacious splashers. •

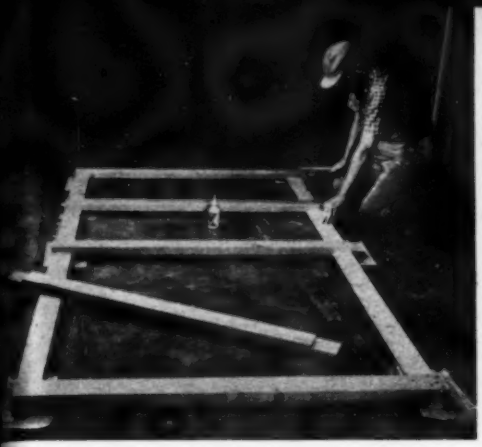
PLAY POOL

Like to be the most popular Daddy on the block? Build this cool, safe, summer wader.

By Paul Corey

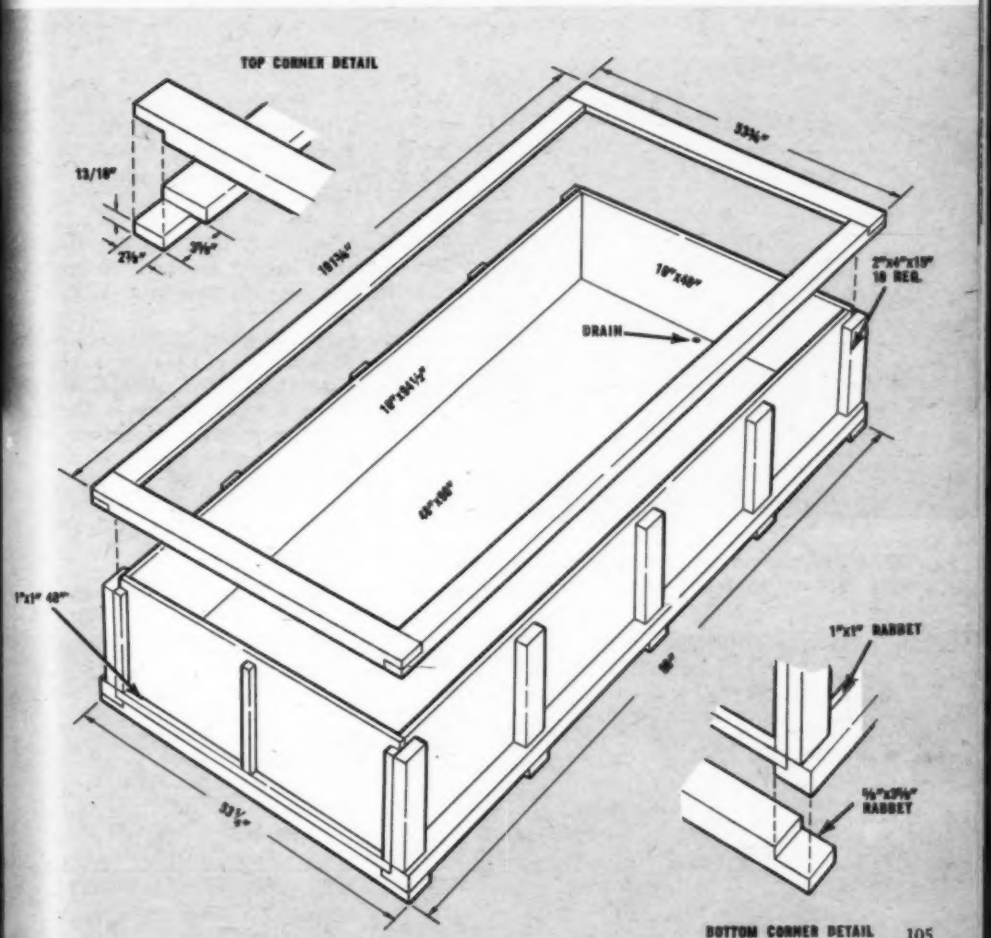
TO build this plywood wading pool for your small fry will cost a little more than the purchase price of a manufactured plastic pool of the same size—but this one will last much longer. The drained pool can also serve as an ideal sandbox. Nor need you throw it out when the kids outgrow it; just coat it with some heavy roof paint, set it into a hole in the lawn or garden and—abracadabra!—you've got a lily pond.

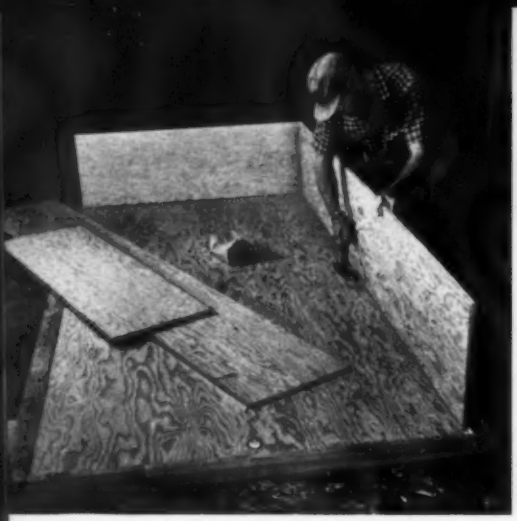
Start by cutting one of the plywood panels into four pieces: two pieces 16x94½ inches and two 16x48 inches (leave the other panel as is). Cut two of the 10-foot 2x4's to 101¾ inches (8′, 5¾″) and the remaining one to 98 inches. From the 12-foot 2x4's cut four lengths 53¼ inches and two 53¾ inches. Then cut the 14-foot 2x4 into one length 53¼ inches and another 98 inches. Finally, cut the remaining



LAP-CUT ENDS of 2x4's are nailed to the 98-inch side pieces to form bottom frame.

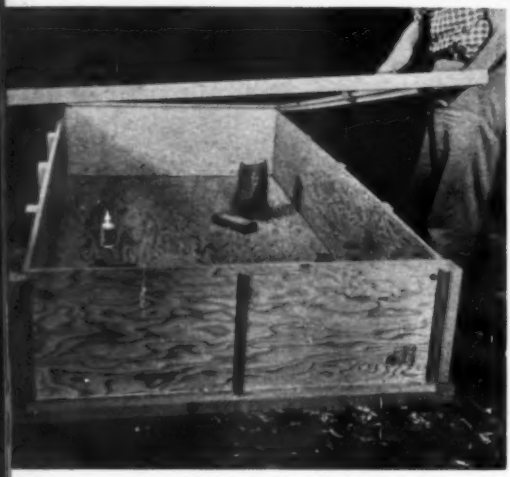
BUSHING, nipple and lock-nut unit fit into counterbored hole in bottom of pool.





SIDES of the pool are toenailed against strips of calking and into line of glue.

SUPPORTS for the sides and corners are 15-inch 2x4's: nail five along each side.



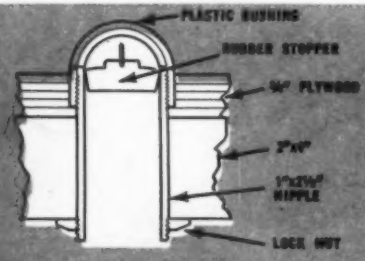
COAMING around top of pool is glued to sides and nailed to the vertical supports.

2x4 pieces into ten 15-inch blocks.

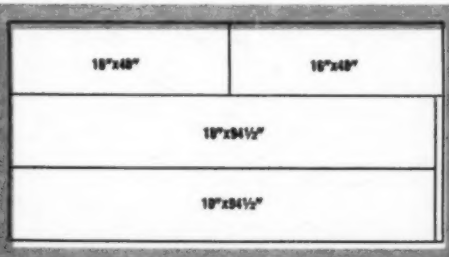
If your 2x4's measure the standard $1\frac{5}{8}$x$3\frac{5}{8}$ inches, remove a $\frac{5}{8}$x$3\frac{5}{8}$-inch section at each end (same side) of all five $53\frac{1}{4}$-inch lengths. Then saw a 1x1-inch rabbet in one edge of each 98-inch 2x4. The two 1x1-inch strips left from this rabbet are then cut into two 48-inch lengths and six 15-inch lengths.

In one side of the two $101\frac{3}{4}$-inch and the two $53\frac{3}{4}$-inch 2x4's cut a rabbet $\frac{3}{4}$ inch wide and $\frac{13}{16}$ inch deep. Cut half-lap joints into the ends of these four pieces so they will fit together in a rectangle, the shorter pieces on top.

To assemble the pool, lay the 98-inch 2x4's flat on the floor, the rabbeted edges down [*Continued on page* 154]



DRAIN SECTION



¾" PLYWOOD CUTTING LAYOUT

IN-THE-GROUND POOL FOR $1,400

This Buster Crabbe Pool Kit can be installed by any home owner in two or three weekends of work.

ASIDE from the price (about one-third that of poured concrete pools of comparable size), the main advantage of this ample 16x32-foot Cascade* Mark 60 swimming pool is the fundamental simplicity of its installation. Every last item needed to complete the pool—including a sand and gravel filtration and recirculation system and the necessary purifying chemicals that are used with it, pipe dope, mason's twine, line level, even a 50-foot steel tape—is packed into the delivered "package." An illustrated installation manual gives detailed step-by-step instructions that make assembly a cinch for anyone (if you prefer the manufacturer to install your pool, add about $800 to the price). We've condensed these instructions to give you a general idea of the assembly job.

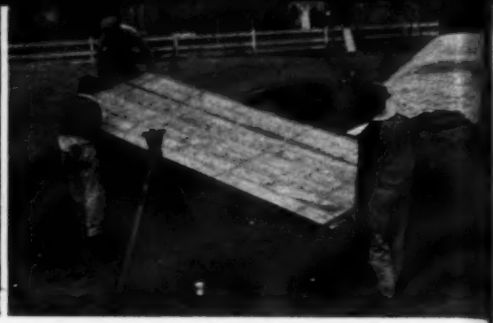
Once you've decided you want a pool—any pool—your first move will be to check before you write the check. Check local building codes and regulations that may apply to private swimming pools. Find out if a building permit is required and whether there are any zoning restrictions.

Then determine the availability of excavating equipment. You'll need a back-hoe, with a minimum capacity of one-half cubic yard, that's able to load excess soil into a truck.

Selecting a proper site for the pool and the filter is important. The more

*Cascade Pools Corp., Talmadge Rd., Edison, N. J.

BURIED beneath bottom of pool, the center strut prevents deflection of side walls.



SIDE WALLS, chemically impregnated under pressure, are termite- and rotproof.

TWO MEN, each with a wrench, can bolt the pool sides together in just one hour.

ROUGH-GRADE pool bottom, lay down the sand, then staple felt paper to side walls.

level the land, the easier and cheaper the installation. Never locate in a low spot where water seepage may create a mud hole, or close to sewer pipes, water lines, underground wiring, etc. The ideal location is an open, sunny spot away from leaf-shedding trees and high buildings. When the site is decided upon, place stakes in the ground to outline the position of the pool. Then spend a couple of days watching how sun and shade affect the area before giving it your final approval.

(Now you can send off that check.)

While the size of the actual pool is 16x32 feet, the size of the hole to be dug should be 18 inches larger on all sides—that is, 19x35 feet—to permit easy accessibility when setting in place the special wood panels that form the sides. In most cases a professional excavator should be hired to dig the hole. This job usually costs about $80.

Outline the excavation with the mason's twine. Then, with the lime that comes with the kit, make an outline on the ground directly below the twine strung between the stakes, so that the back-hoe operator will know the limits of excavation. Now dig the hole.

Upon completion of the excavating work you are ready to proceed with the assembly of the pool, carefully following the instructions in the installation manual regarding the center-brace post strut assembly and the pool side walls.

With the sides of the pool in place you can turn to the work of grading the bottom. Knock the soil ledge partly into the deep end (hopper) and begin to shape the hopper. All soil within the confines of the pool should now be tamped thoroughly. Then apply two to four inches of sand top dressing to the bottom for final grading.

Positioning the wall fittings and attaching the interlining and gasketing materials is the next order of business.

The fittings for the suction and return lines are installed in holes drilled in the sides.

To install the vinyl liner you'd better enlist the aid of a few friends. Later you will also need their help for about half an hour when you first put the water in your pool.

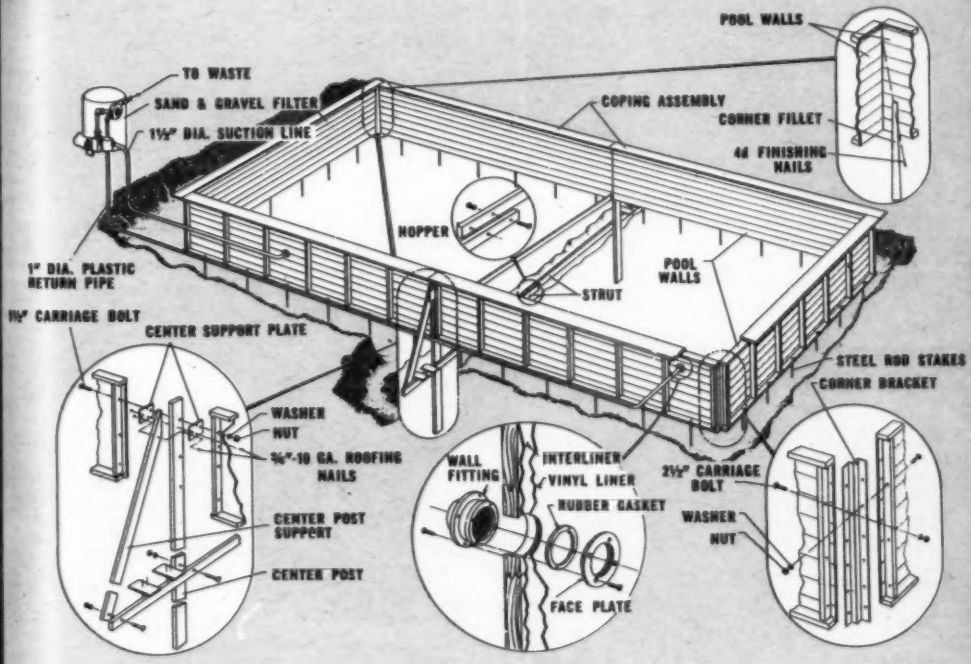
It is advisable to remove the liner from its drum and unroll it several hours before its installation so that the vinyl material will have some time to relax and recover from the packing creases. When carrying the liner over to the pool be very careful not to snag it on any sharp objects. Drop the liner in the pool at one of the long sides and progress to the other side of the pool, working the material out sideways so as to suspend it over the whole expanse of the pool.

Adjust the liner so that it rests directly in the apex of the shaped bottom. Position the bottom corners of the hopper at the bottom corners of the deep-end wall and the bottom of the side-wall joints. Justify the liner by tugging and smoothing until all bottom seams lie along the bottom edge of the hopper. Now run in about two inches of water. The liner should be smoothed out as much as possible at this point because it is extremely difficult to remove wrinkles under pressure. Use a vacuum, as shown, to remove air.

Using a garden hose, run about 200 gallons of water into the hopper portion of the liner to seat the apex of the hopper. When the liner is properly centered, start the water again.

As more water is added to the pool, wrinkles may be smoothed out with a pool brush. If it becomes necessary to enter the pool to remove wrinkles, wear flat rubber-soled gym shoes and be careful not to disturb the sand under the liner.

As soon as water starts covering the shallow end, backfilling should begin behind the wood panels. However, at no time should the height of the backfill exceed the height of the water by



POOL CONSTRUCTION DETAILS

more than six inches, nor the height of the water exceed the height of the tamped backfill by more than three inches. As the backfill approaches each opening, the various wall fittings are connected.

Grading should permit rain water to drain quickly away from the pool. The filter should be inconspicuously located no more than 18 feet from the deep end of the pool. Landscaping around the pool should include six to ten feet of play area, at least around the deep end and one side.

The installation is completed with assembly of sand and gravel filter and finishing touches to the landscaping.

To provide maximum safety, the walk around your pool should be of a non-skid material such as concrete. Also, it is wise to erect a fence around the pool to prevent unchaperoned children from entering the area.

As the installation manual states: "A swimming pool is the essence of graceful, healthful living." And how much *more* appreciative you'll be of this excellent facility when you measure its value to you and your family against its comparatively modest price. •

SANDED BOTTOM must be raked to specifications; then wet down, roll and tamp it.

VINYL LINER is forced into slots along top of panels with T-shaped plastic spline.

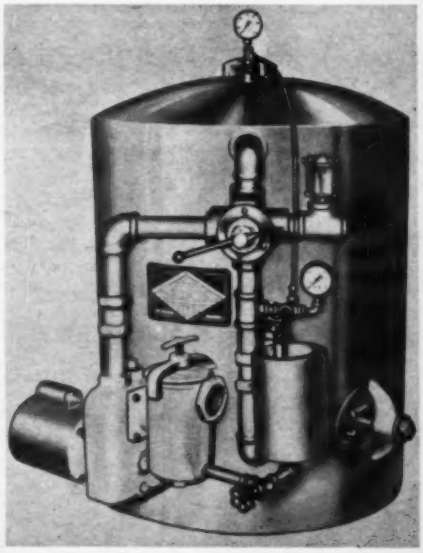
VACUUM CLEANER presses liner into place by extracting air between liner and pool.

FINISHED AT LAST! Your own beautiful landscaped swimming pool—all for $1,400.

SWIMMING POOL ACCESSORIES

SCORES OF ACCESSORIES are available to fill every need of swimming pool owners.

KLEEN-POOL, a liquid algaecide, keeps wading pool water fresh and clean. $1.49.



ANTHRASILT filter has built-in chlorinator, backwash dial; never needs cleaning.

Multi-Mark III Filter System, $545. Fabro Equip. Corp., 21 Goodale Circle, New Brunswick, N. J.

OPEN-MESH polyethylene pool cover keeps out debris; 20x40-foot cover: about $120.

Reeves Bros., Inc., 1071 Avenue of Americas, New York 18, N. Y.

AERATOR-CIRCULATOR unit with polyethylene tubing lets pool water "breathe."

Hank Meyer Assoc., Inc., 407 Lincoln Rd., Miami Beach, Fla.

CERAMIC DOLPHINS can be installed on sides of pool to lend a nautical effect.

Swimquip, Inc., 3301 Gilman Rd., El Monte, Calif.

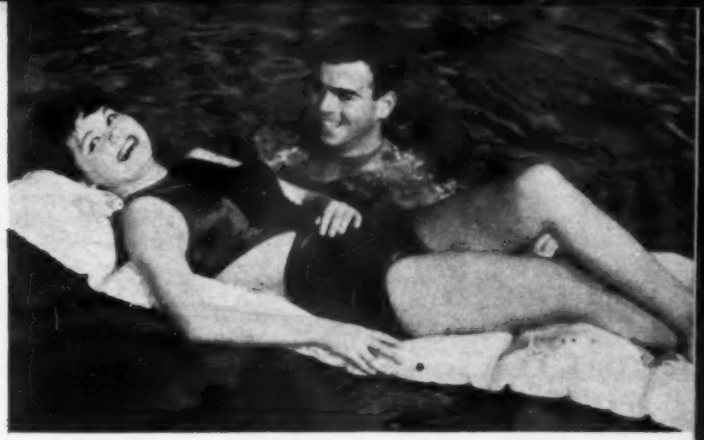
VACUUM CLEANER, an essential accessory, picks up debris from bottom of the pool.

Swimquip, Inc., 3301 Gilman Rd., El Monte, Calif.

TOUGH ceramic pool steps are easy to install. They're available in gold and blue.

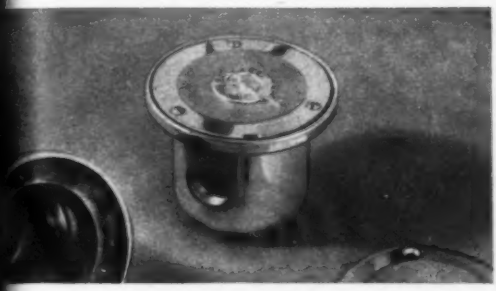
Swimquip, Inc., 3301 Gilman Rd., El Monte, Calif.

ANOTHER popular ceramic pool decoration is Swimquip's winsome mermaid . . . at left.



INFLATABLE mattress lets you drift lazily around your swimming pool under the tanning rays of a summer sun. Priced from $10 to $20.

Firestone Plastics Co., Pottstown, Pa.



DECK BOX provides safe housing for junction of power line to an underwater light.

Swimquip, Inc., 3301 Gilman Rd., El Monte, Calif.

DIATOMITE filter for pools up to 10,000 gallons filters 989 gallons per hour. $111.

Lomart Industries, Inc., 199 Bleeker St., Brooklyn, N. Y.

For information about the new "Midgie 800" filter for small pools which sells for $80, write Fabco, 21 Goodale Circle, New Brunswick, N. J. . . . A 16-page booklet, Pool Owner's Handbook, covering the operation and care of pools, can be had for 25c by writing Lomart Industries, Inc., 199 Bleeker St., Brooklyn 37, N. Y. . . . A full line of pool safety equipment, including aqualungs, resuscitators, life rings, etc., is available from National Pool Equipment Co., Lee Highway, Florence, Ala.—send for their catalog. . . . Want to use your pool the year 'round? Schjeldahl Co. of Northfield, Minn., will be happy to send you information on their new low-cost inflatable pool dome. . . . Hubley Mfg. Co., Lancaster, Pa., has a new inexpensive line of pool toys including swim boards and safety rings. . . . If you're in the market for some strong, buoyant, lustrous plastic rope for your pool, write U. S. Plastic Rope, Inc., 2581 Spring St., Redwood City, Calif. . . . Painting your pool? A new tough protective coating for pools is being marketed by Associated Tank Services, 212 E. 26th St., New York 10, N. Y. A.T.S. can also arrange to do the job for you.

ORNAMENTAL supply fitting is a brass lion's head; water pours from lion's mouth.

Josam Mfg. Co., Michigan City, Ind.

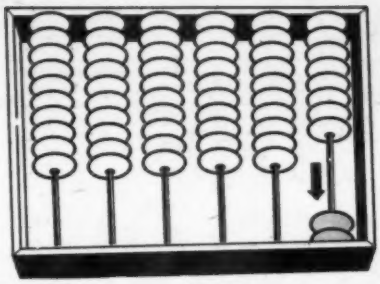
HOW TO USE THE ab′a·cus

(ăb′ȧ kŭs), *n.*; *pl.* ABACI (-sī), -CUSES (-kŭs·ĕz; -ĭz). [L., fr. Gr. *abax.*] 1. An instrument for performing calculations by sliding counters along wires.

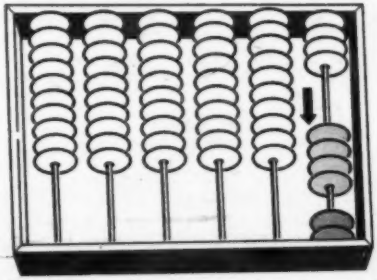
By Robert Brightman

WHEN you pick up your wash at a Chinese laundry, the chances are that the slant-eyed man behind the counter will pull out from some mysterious recess an oblong device that looks like a picture frame with a number of beads strung across it on wires.

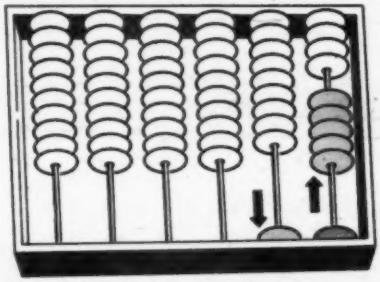
He then gives you a crafty look and says, "Thlee dollah, sixty-thlee cents, please." After you have paid him and walked out, did you ever wonder how this devilish contraption works? Or do you just say to yourself, "Heck, that dingus is just a front. That guy needs $3.63 for lunch [*Continued on page* 147]



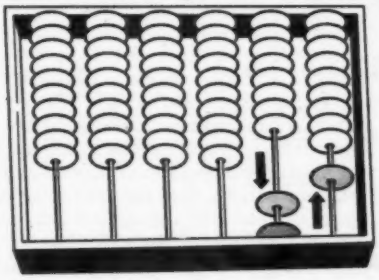
A. We are going to add 2+4+5+9. Always start in the right hand column with all beads up. Move down 2 beads as shown.



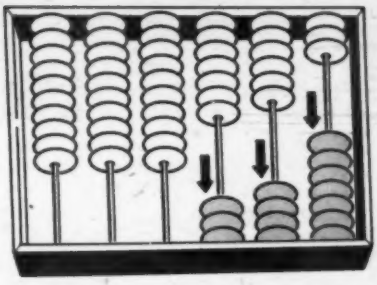
B. To add 4, move down 4 more beads in the units column. We now have a total of 6 beads in the units column, see above.



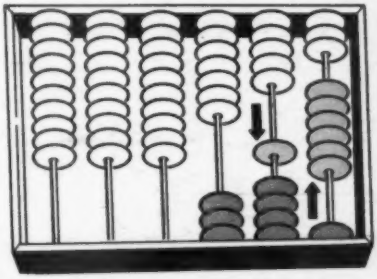
C. To add 5. Only 4 beads are in units column, so move down 1 bead in tens column and move up 5 in units column.



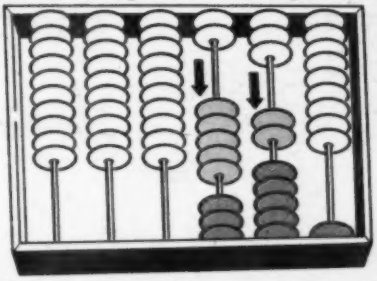
D. To add the 9, move down another bead in tens column and move up 1 in units column (10 minus 1 is 9). Answer is 20.



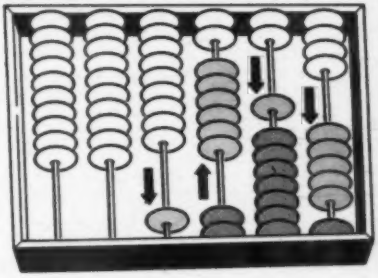
E. Now let's try something harder. We are going to add 347+524+415. Move down 7 on units rod; 4 on tens; 3 on hundreds.



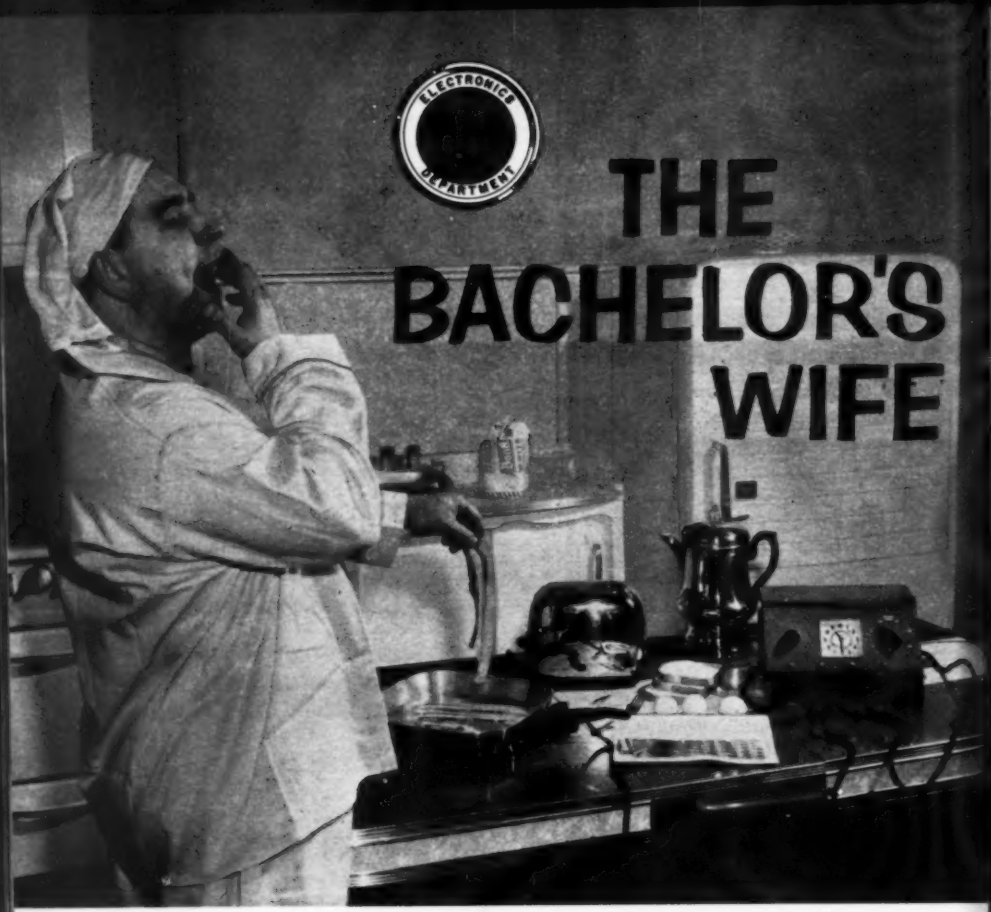
F. To add 524, move down 1 on tens rod and move up 6 on units rod. This adds the 4 in 524. Always work from right to left.



G. To add the 2 in 524, move down two in tens column. To add the 5, move down 5 beads in the hundreds rod or column.



H. Now to add 415. Move down 5 in units; move down 1 in tens; move down 1 in thousands, move up 6 in hundreds. Answer 1286.



THE BACHELOR'S WIFE

At last! An electronic robot with a culinary flair that fries your bacon, toasts your bread and brews your coffee—and then trips the alarm to wake you up!

By Harvey Pollack

STILL struggling along without a full-time cook? Poor chap! How well I know the early a.m. agonies afflicting you—the rubbery eggs, burnt toast and bitter coffee that have been your hapless fare . . . 'til now! For now this ageless problem has been solved and the bumbling bachelor's botched breakfast must bow to the Electronic Age.

Our hero, George (of the Let-George-Do-It family), is a 24-hour electric timer that can handle three appliances in sequence with time delays between each. And it is so designed that overloads cannot occur.

Say that our man is looking forward to a breakfast of coffee, toast and fried bacon and eggs. On the previous night he sets his robot's built-in alarm clock, prepares the electric percolator, cracks a couple of eggs and puts some bacon in the greased electric frying pan, drops some bread in the toaster and plugs each appliance into his "electronic wife."

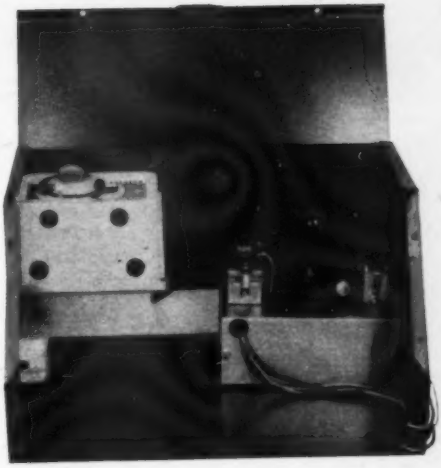
The following morning the cycle begins: the percolator comes to life first; two or three minutes later the frying pan goes to work for a time period previously selected. Next, the alarm clock brings our sleeping soloist to life. The electric frying pan then turns itself off and the toaster comes on. Throughout the process the thermostatically controlled percolator continues brewing the coffee. Finally the toast pops up from the toaster—and breakfast is ready. C'mon Joe, get *up!*

The triggering mechanism for the sequence described is a Paragon Ti-Mite timer. At a predetermined time the Ti-Mite applies power to the console and simultaneously energizes the receptacle on the console panel that feeds Unit No. 1.

Two or three minutes later a thermal relay makes the contact necessary to snap in a 117-volt AC relay which feeds power to the Unit No. 2 receptacle (automatic frying pan). Of course, an electric hot plate can be substituted for the frying pan if Joe prefers his eggs boiled. At the same time an electronic timing delay circuit is activated to control the *On* time of Unit No. 2. This interval is adjustable from 2 to 25 minutes by means of a dial and calibrated markings on the front panel. At the close of the electronic timing period, Unit No. 2 shuts off and Unit No. 3 comes on automatically. *The relay circuits make it impossible for both to be energized at the same time.* Tiny neon jewels connected to the unit receptacle show when the power is on; a large neon bull's-eye is the *On-Off* indicator.

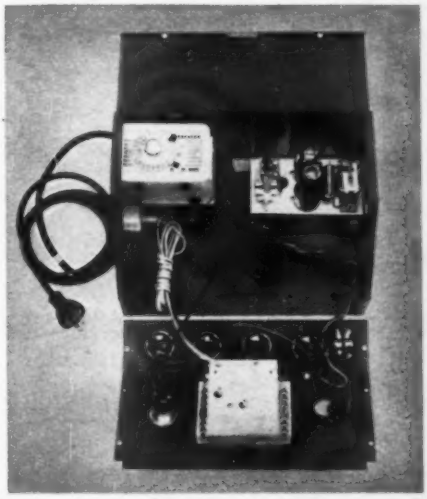
The receptacle provides a spare outlet to replace the one occupied by the timer. By throwing the control switch to the *Up* position, this outlet comes alive regardless of the setting of the Ti-Mite unit.

An inexpensive electric clock has been mounted in the center of the panel. Here again the switching arrangement prevents the possibility of overload since it allows the application of power either to the utility receptacle or to the timing circuit, but not to both at the same time. Both the clock and the Ti-Mite operate continuously so that resetting for routine days is unnecessary. The main switch has a center-zero *Off* position.



TI-MITE (left) is supported on aluminum shelf; it's easily removed for other uses.

So that the openings in the sloping front of the cabinet will be properly made, their exact diameters are as follows:



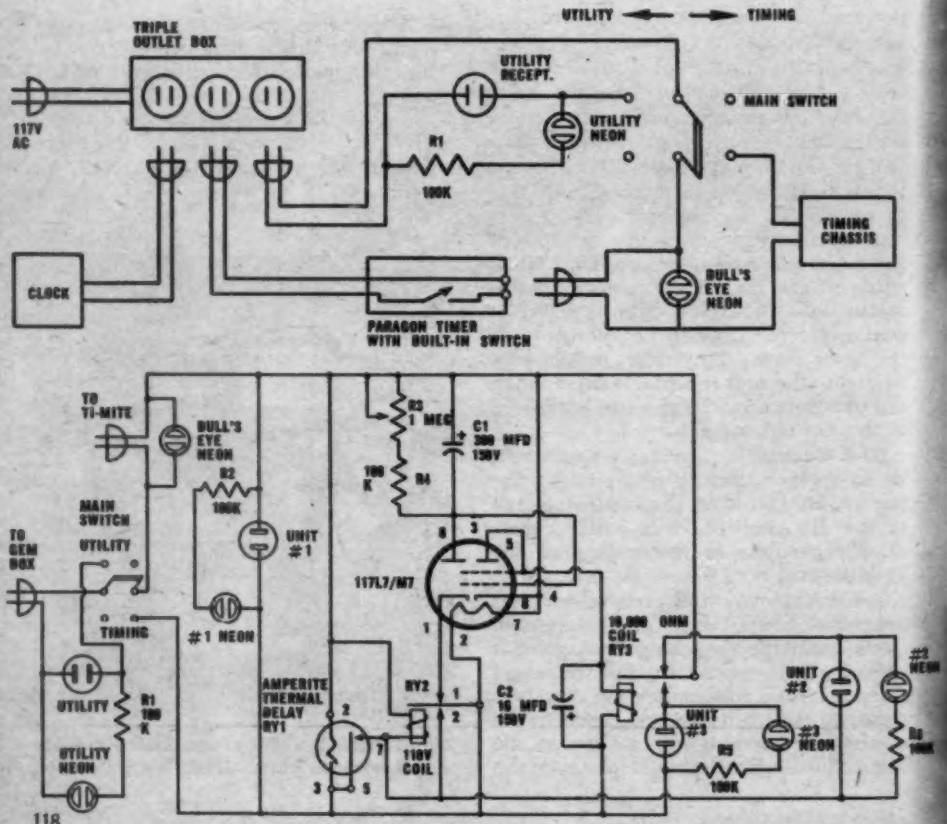
OPEN FRONT VIEW of assembled console shows various parts. Clock, bottom center.

FINISHED CONSOLE can be used as a portable unit or else permanently installed.

Unit receptacles	1⅛"	(4)
Main switch	9/16"	(1)
Neon jewels	¼"	(4)
Neon bull's-eye	1"	(1)
Clock	2¼"x3"	(1)
Timing control	⅜"	(1)

The receptacle holes were made with tube socket punches as was the one-inch hole for the large neon assembly. The rectangular clock hole was hacksawed and filed smooth. The remaining holes were drilled.

The small chassis supporting the electronic parts is the long-sided half of an aluminum Minibox (see Parts List). Two holes of $1\frac{1}{16}$-inch diameter are cut in the large face of the chassis to receive two octal tube sockets. The two relays mounted on the same surface are secured with 6x32 machine screws and nuts. The other half of the Minibox is the shelf on which the Ti-Mite rests; it measures 4¼x2⅞ inches. Its front and right sides are [*Continued on page* 148]

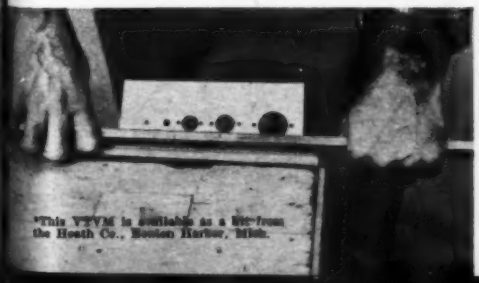


FILAMENT TESTER

CLIP and banana plug connect ohmmeter to socket for checking filaments.

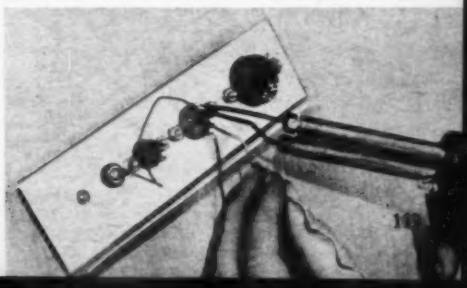
A handy accessory for a VTVM* (ham talk for a vacuum tube volt meter) is an aluminum base on which are mounted the three most popular vacuum tube sockets. A seven, eight, and nine-pin socket will take care of most modern-day tubes. Lay out, drill and bend the chassis from $\frac{1}{16}$-inch aluminum stock; then mount the three sockets. Wire one side of the filament leads to a banana jack and the other side to a brass bolt. To test a tube for filament continuity, set the ammeter to its lowest resistance value. •

CHASSIS is bent to shape in vise after holes have been drilled and punched out.



*This VTVM is available as a kit from the Heath Co., Benton Harbor, Mich.

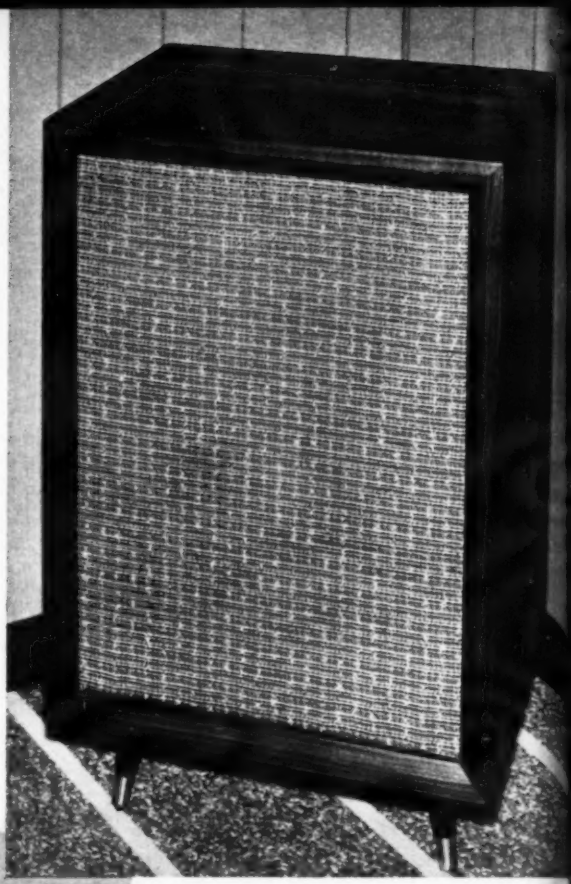
MOUNT sockets in their respective holes. Secure the wiring connections with solder.

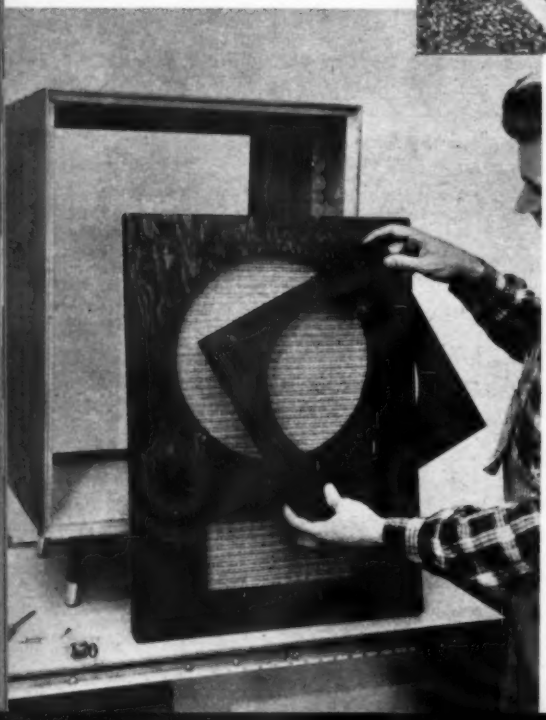


HI-FI WOOFER

A speaker-cabinet combination for 30-cps bass response with only 2.5 cubic feet of "free" volume.

By John Michaels



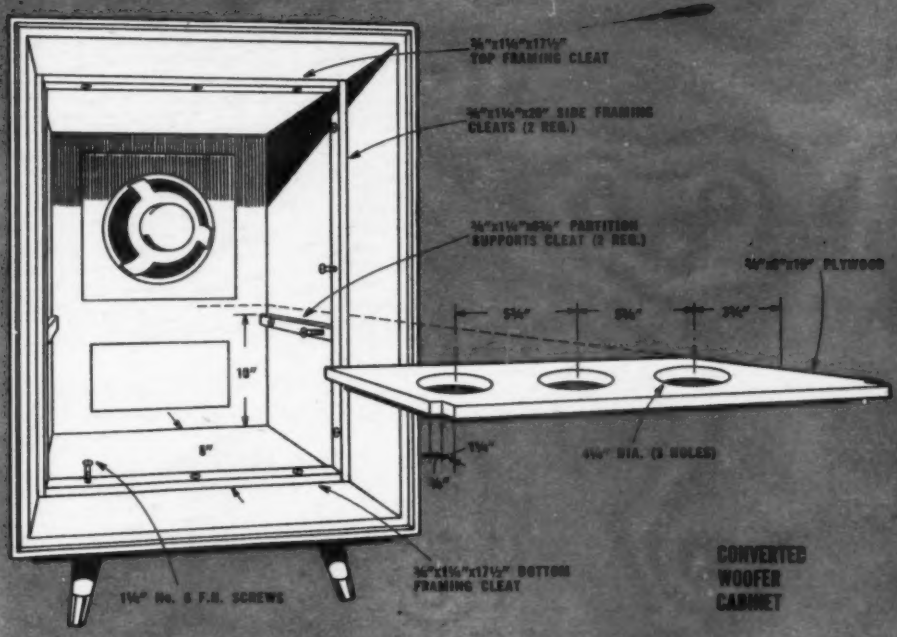


THIS Fiberglas-lined enclosure for the model 350 Janszen* woofer has a volume of 2.5 cubic feet. The assembled cabinet, available from Homewood Industries, 26 Court St., Brooklyn 1, N. Y., must be "cut down" slightly to meet this volume requirement.

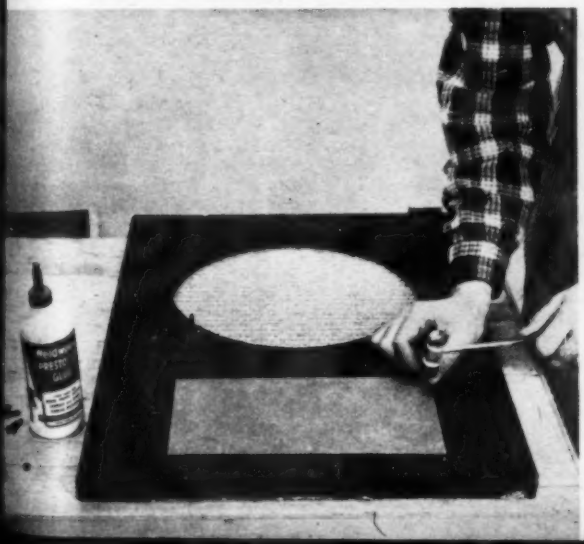
The conversion is made by installing cleats on the inside walls to reduce the cabinet's cubic area. The back panel is then cut down as shown to fit. A partition with three large holes serves to brace front and back. [*Continued on page* 132]

SPEAKER SUPPORT FRAME is removed from front panel, and front panel from cabinet, as shown.

*Neshaminy Electronic Corp., Easton Rd., Neshaminy, Pa.

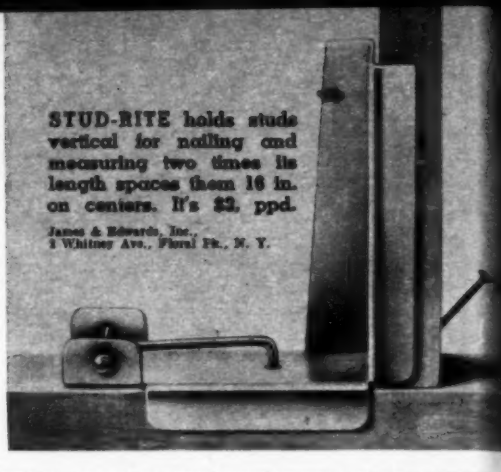


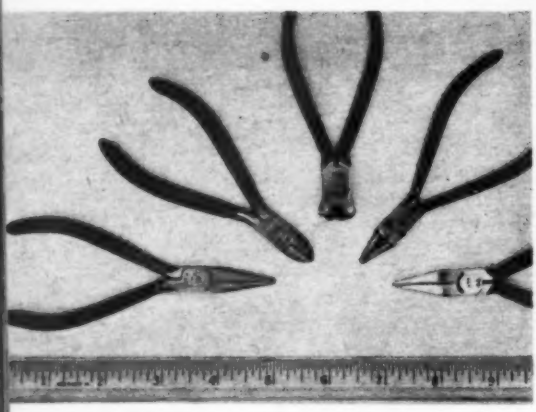
LOWER GRILLE of front panel is closed by gluing and nailing a piece of panel board over it.



APPLY sealing material to speaker flange; fasten speaker to the frame.

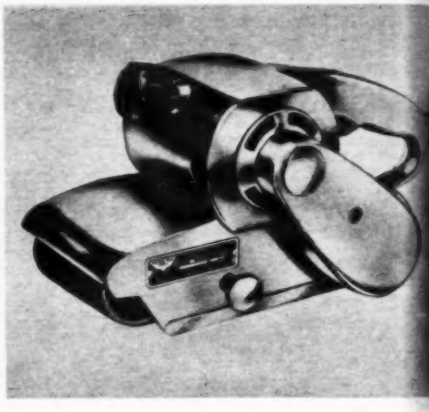
MI's HARDWARE STORE





LITTLE CHAMP set of precision pliers and cutters is designed for technicians, jewelers, etc.

Champion DeArmont Tool Co., Meadville, Pa.



BELT SANDER, a heavy-duty model, has 1-hp motor and 4x21-in. belt, is $84.50.

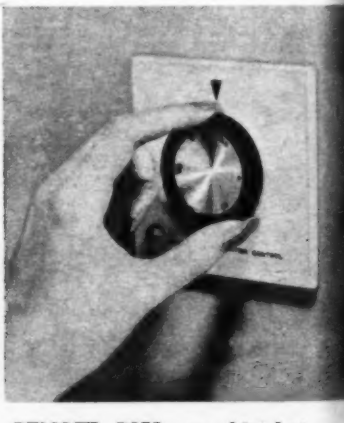
Miller Falls Co., Greenfield, Mass.

REDWOOD paneling secures with an adhesive.

Simpson Redwood Co., White Bldg., Seattle 1, Wash.

MIXER takes anything from concrete to paint, is $29.95.

Kol, Inc., 2233 Ellis Ave., St. Paul, Minn.



REMOTE DIAL on this hot water heater sets temperature.

Rheem Mfg. Co., 7600 S. Kedzie Ave., Chicago 52

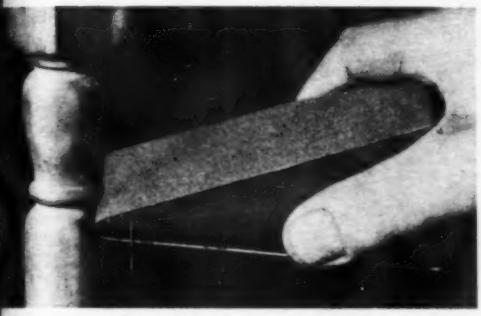
MATCHING desk and reading lamps feature glare-free, light-diffusing plastic shades.

Lightolier, Inc., 346 Claremont Ave., Jersey City, N. J.

BATTERY savers hold copper coins, stop terminal and clamp corrosion. 49c a pair.

U. S. Polymer Corp., Box 282, 1990 Broadway, N. Y. 23

* * *



HAND SANDER is wedge-shaped to get into corners and difficult spots, costs 79c.

Mid-West Abrasive Co., Owosso, Mich.

L. S. Starrett Co., Athol, Mass., will send you a free catalog describing 88 new tools including drafting instruments, micrometers, calipers, vernier gages, etc. . . . Better Specialties, Inc., 605 W. Wash. Blvd., Chicago 6, makes a clear plastic safety shield with permanent magnets that can be attached anyplace on a power tool to protect against flying chips . . Potential ham radio operators can get a free pamphlet, "Short Course for the Novice License," from EICO, 33-00 Northern Blvd., L.I.C., N. Y. . . Helpful information on hanging mirrors, cabinets, etc., is found in "Star Plastic Anchors," free from Star Expansion Industries, Mountainville, N. Y.

CLAMP WRENCHES with 2-, 3- and 4-inch jaw capacities are $3.95, $4.50 and $4.95.

Prince Enterprises, Inc., 60 E. 42nd St., N. Y. 17

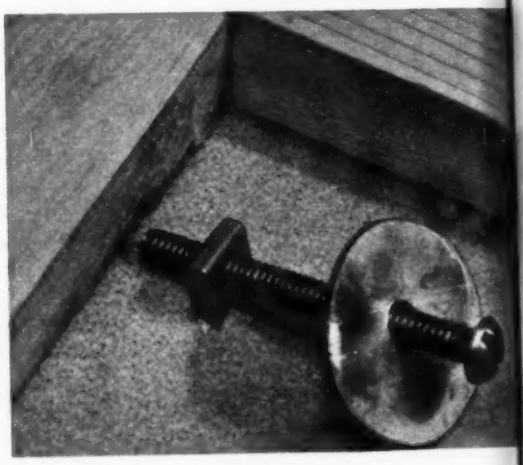
MOTOR HOLDER takes diameters between 6-1/16 and 6-11/16 inches, is $1.75, ppd.

Lemmerman-Walstedt Co., 519 Lincoln Ave. N.E., St. Cloud, Minn.

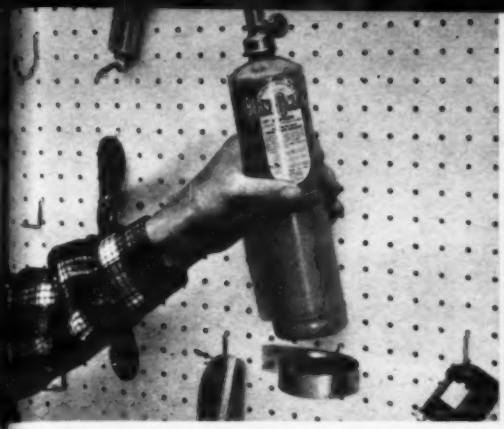
MASKING TAPE around drill bit serves as depth gauge; swirling flap will show when desired depth has been reached. This device will facilitate drilling of blind holes.

KNOCKOUT PLUGS left over from junction boxes can be put to good use as reinforcers for loose miter joints (above) or as washers for machine screws (below), if appropriate holes are drilled as shown. MI doesn't advise using these plugs as slugs.

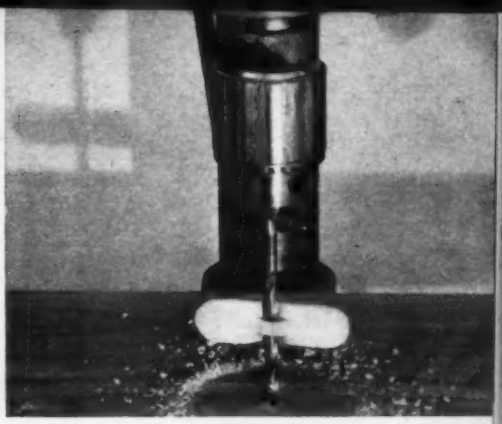
HOME AND SHOP SHORTS



FREDDIE FUMBLES

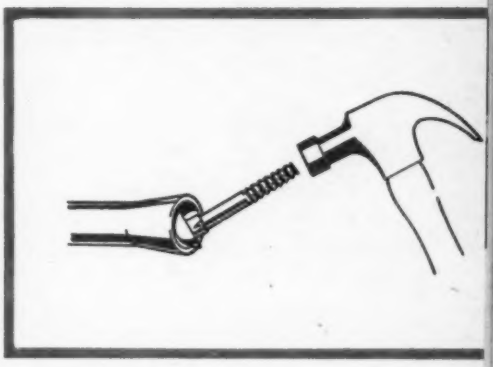


TALL PROPANE TORCH will be held safely in a sheet-metal cup soldered to a pegboard hook that holds cup to the pegboard.



STRIP OF RUBBER, slit and slipped over drill bit, fans shavings away from stock to permit operator constant view of work.

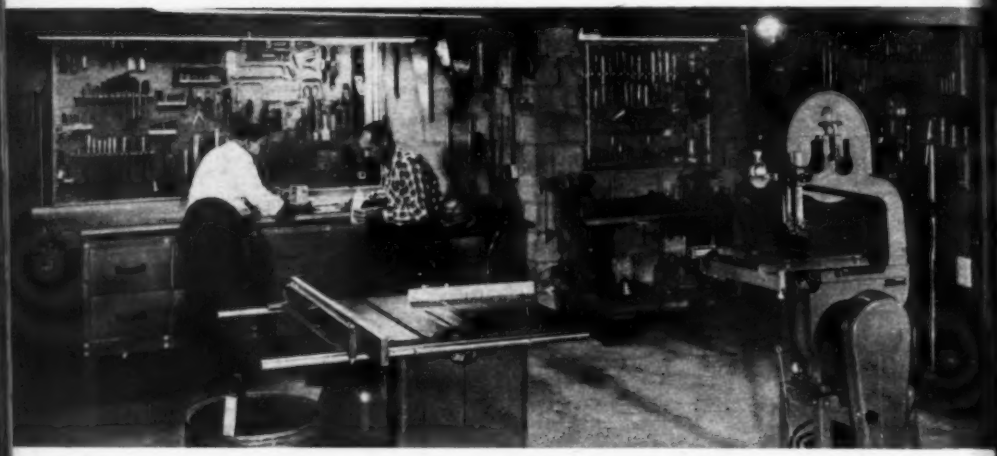
SCRAPS of vinyl upholstery material make handy mats on which to put plants, vases and lamps; cut edges with pinking shears.



ROUND carriage-bolt head serves as emergency flaring tool: tap head against end of tubing until desired flare is achieved.

Send Freddie Fumbles your idea of a good short-cut time-saver or safety device in your work, whether it be in the home, shop, office or farm. Each tip accepted will be paid for at the rate of $10. Naturally we cannot acknowledge or return the ones we cannot use. However all will be carefully read and evaluated. (Those which we can use in other departments of MI will be paid for at our regular rates.) Please send in your ideas on a post card only. Address to Freddie Fumbles, *Mechanix Illustrated*, 67 W. 44th St., New York 36, N. Y.

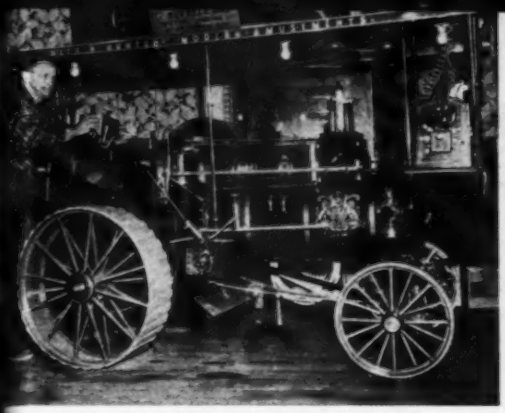
Golden Hammer Award Winners



BASEMENT WORKSHOP of George Groya, Glenshaw, Pa., measures 18x25 feet. Eight-foot workbench, six Delta power tools and a complete set of hand tools make any job possible.

HOUSE TRAILER was designed and built by Ray Wilson, Cameron Falls, Ont., Can. It has a bathroom and kitchen and sleeps four. The body is birch plywood over spruce ribs.

BIRCH AND MAPLE kitchen cabinets show the craftsmanship of Charles Bloom, Ronks, Pa. Not shown is the "disappearing" food file—of hinged shelves—for canned goods.



JACK SMITH of Winston-Salem, N.C., gives a loving pat to the quarter-scale working model of an old Scotch traction steam engine which he built from scratch for $100.

MAHOGANY COCKTAIL TABLE has a marble top. The "harp strings" are ⅛-inch welding rods. Builder Don Bradley, Galesburg, Ill., hand-carved the mahogany rose.

CATAMARAN was designed and built by Joe Szekely, South Bend, Ind. A 16-footer, its plywood hull draws only two feet of water.

S.S. UNITED STATES model of wood and metal has 1,100 portholes, cost $55. Made by Salvatore Tranchina of Brooklyn, N. Y.

Each craftsman whose project is shown receives a 24-karat gold-plated Hammer and a Workbench Award Certificate. Runners-up will be sent a beautiful gold-plated Golden Hammer Tie Bar or MI's Certificate of Merit. So send us some *black-and-white photos, with negatives,* and a full description of your latest project. Photos of your workshop are also eligible. Send all entries, with return postage, to MECHANIX ILLUSTRATED Golden Hammer Awards, 67 West 44th St., New York 36, N. Y. Entrants are advised that MECHANIX ILLUSTRATED cannot accept responsibility for customs charges, duties, taxes, etc., levied against Golden Hammer and Golden Hammer Tie Bar winners outside the United States.

The following craftsmen have been awarded GOLDEN HAMMER TIE BARS for their projects: George O. St. Onge, Richford, Vt. . . . R. W. Heidein, Mineola, N. Y. . . . Richard Pratt, Jackson, Mich. . . . Jacques Duchesne, St. Genevieve, Province Que., Can. . . . Victor Real, Correo, Havana, Cuba. . . . Mrs. Robert Plaeffin, Winstead, Conn. . . . Benjamin R. Hager, Osceola, Iowa. . . . Ralph Ilsen, Philadelphia, Pa. . . . Raymond J. Hibbard, Schenectady, N. Y. . . . Johnnie Lyndell Jones, Ashland, Ill. . . . Robert C. Pixley, Shelton, Conn. . . . Donald P. Granger, M.D., Hamden, Conn. . . . Nicholas Pintavalle, Passaic, N. J. . . . E. R. Brady, Jackson, Miss. . . . L. W. Musser, Barberton, Ohio. . . . Frederick Herbert Davis, Windsor, Vt. . . . W. J. Flynn, Detroit, Mich. . . . Charles E. Juran, Redlands, Calif. . . . D. J. Toll, Colon, Mich. . . . Donald E. Dorsett, Cham- [Continued on page 147]

New Ideas in Photography

Dramatic advance in flash photography!

New Brownie Starmite Camera—so small it fits *inside* an old-type 5-inch reflector.

Compact flash camera takes bright, full-size pictures

—uses bulbs as small as jelly beans

Meet the smallest camera with built-in flash in Kodak history!

The new Brownie Starmite Camera fits in your palm or pocket—yet uses regular 127 film for big prints or super-slides. It's always ready—indoors or out, day or night.

The built-in reflector is only two inches across. With tiny low-cost, zirconium-filled AG-1 flashbulbs, it can flood a room with light. Flash exposure data is printed right on the camera itself.

No focusing. Just aim through the big viewfinder and press a button. Results? Beautiful color or black-and-white snapshots, or color slides—12 pictures to a roll. And it costs only $10.50.

For the same efficient flash system, but even larger pictures on 620 film, see the Brownie Flashmite 20 Camera, $14.95. Or ask about equipping your present camera with the $3.95 Kodak Supermite Flasholder that uses the same new AG-1 bulbs.

"Picture it now—See it again and again."

New Kodak projector adds sound to 8mm movies.

New Alloy Brings Quality Sound To 8mm Home Movie Projection

A new metal alloy developed by the Navy—called Alfenol—has led to a major breakthrough in magnetic sound reproduction.

Used in the magnetic recording head of the Kodak Sound 8 Projector, it lets you add sound to 8mm movies with exceptional realism.

Alfenol is "soft" magnetically, so it assures high-quality sound reproduction. And it is physically very hard, making it virtually impossible to wear out. Kodak Sound 8 Projector costs $345.

from Kodak

Atomic "Missing Links" Are Found Through Bubble-Chamber Photographs

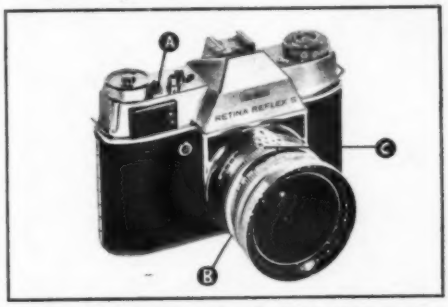
The birth and death of an invisible atomic particle called the "anti-lambda" was recorded recently on Kodak film.

The particle was released by the action of a giant 6-billion-electron-volt accelerator discharged in a bubble chamber of liquid hydrogen. The particle left a trail which could be captured and studied only through photography.

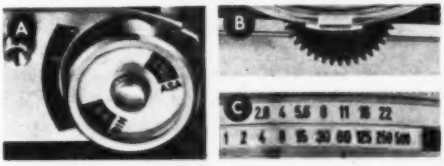
To get the pictures, physicists chose Kodak Linagraph Shellburst Film, originally created to analyze anti-aircraft explosions. Its fast speed, high contrast, and moderate grain helped lead to this atomic discovery.

Knowledge gained by Kodak in developing such specialized products for science and industry assures ever-finer films for amateur use.

Bubble-chamber picture shows point **(A)** where lambda and anti-lambda particles were produced. Since both are neutral electrically, they left no tracks until decaying into particles leaving tracks **(B)** and **(C)**



New Kodak Retina Reflex S with built-in meter.



For exposure control, aim the camera at your subject. You will see the meter needle move in the window **(A)**. By turning a finger-tip wheel **(B)**, you cover the meter needle with a pointer. This automatically gives you the right lens opening. If you change shutter speeds **(C)** the lens opening readjusts automatically.

Change Camera's Shutter Speed—Lens Opening Adjusts Automatically

Why is one of the world's most advanced and versatile cameras so remarkably easy to use?

Partly because the new Kodak Retina Reflex S Camera has *photoelectric* exposure control with all lenses, all shutter speeds, all films.

Partly because you aim directly through the lens, see your subject natural size. And your view is clear even in dim light. The automatic diaphragm keeps the lens *wide open* until you snap the picture.

You focus either on ground glass, or with a critical split-image rangefinder. Automatic indicators show near and far limits of sharpness.

Speed settings go from one second to 1/500, and a scale shows exposure needs up to 250 seconds for dim-light or small-aperture shooting. Interchangeable lenses from 28mm to 135mm are available as well as specialized aids.

See the great Kodak Retina Reflex S. With 50mm *f*/1.9 lens, $235. With 50mm *f*/2.8 lens, $199.50, or as little as $20 down.

Prices are list, include Federal Tax where applicable and are subject to change without notice.

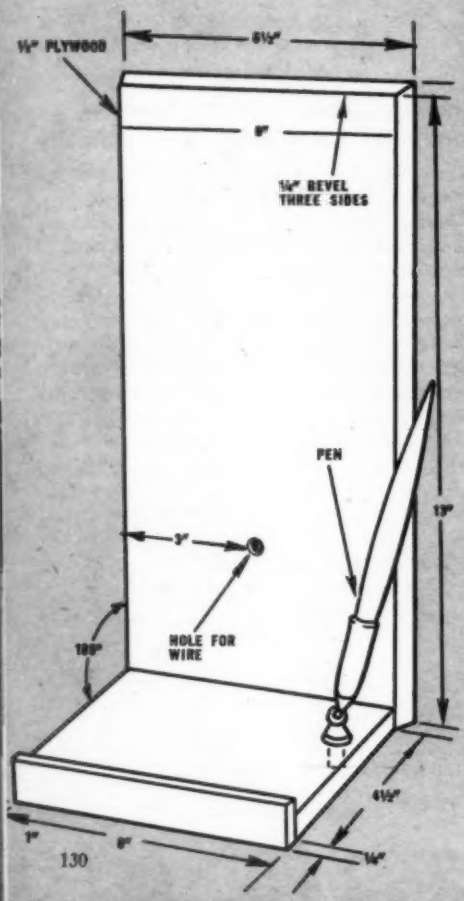
Kodak
TRADEMARK

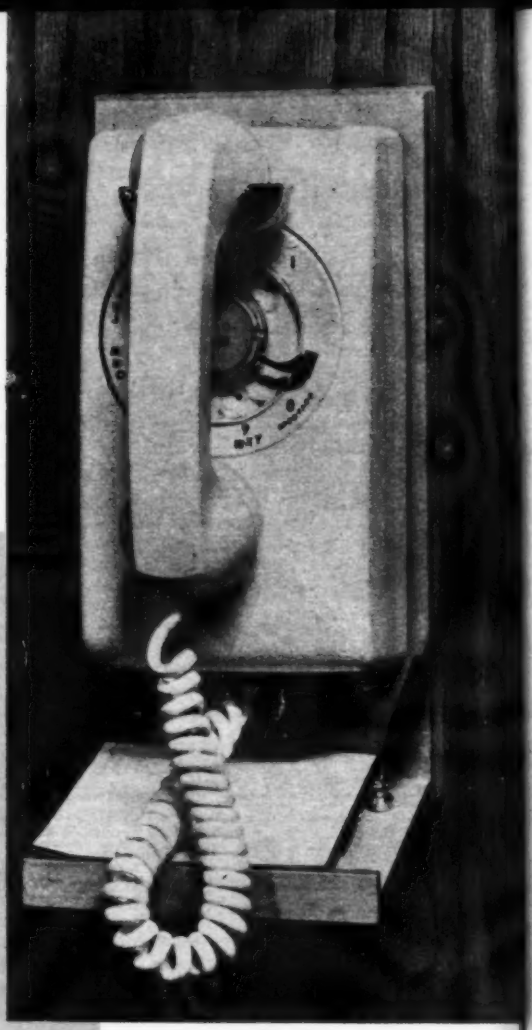
EASTMAN KODAK COMPANY, Rochester 4, N.Y.

See Kodak's "Adventures of the Nelson Family" and "Ed Sullivan Show"

TELEPHONE SECRETARY

"Hold the line while I get a pencil. Darn it, where's some paper?" H'm, these familiar words will no longer plague you if you make this handy paper, pencil holder for your phone.





MAKE the back and shelf out of one-half-inch birch plywood. The lip is cut from quarter-inch stock. Sand and lacquer. The pen and its holder came from an old desk set. You can get a new unit at any stationery store.

To install the shelf, you will have to remove the phone from the wall. Do this by first pressing the catch at the bottom of the phone. This will permit you to remove the rounded plastic box forming the body, exposing the innards. Remove the three colored wires from their binding posts. They are pink, [*Continued on page* 154]

MODERNIZE YOUR CAR'S PERFORMANCE WITH AN ORIGINAL EQUIPMENT CARBURETOR REPLACEMENT!

Available Now at Your Nearby Rochester-GM Carburetor Specialist's AT A NEW LOW PRICE!

When you need a replacement carburetor —see that it's a new Rochester-GM Carburetor . . . number one for original equipment. These replacement carburetors have the very latest engineering advances, giving your GM car up-to-the-minute performance. And they're at a new low price! They're engineered, manufactured and tested to the highest standards.

Rochester-GM Carburetors are original equipment on the new GM cars, including the new Corvair. Get a Rochester-GM Carburetor replacement for your GM car . . . update your performance and get new-car economy. Ask about it at your factory-trained Rochester-GM Carburetor Specialist's. *Rochester Products Division of General Motors, Rochester, New York.*

If top-quality service is your business, ask your local UMS distributor about Rochester-GM replacement units. It's one of the many factory-approved service items in the fast-moving Rochester-GM Service Line.

GM CAR
GENERAL MOTORS

America's number one original equipment carburetors

ROCHESTER CARBURETORS

a wire-stripping notch

that **REALLY WORKS!**

Specially Designed

CHANNELLOCK®

No. 728 Long-reach

Diagonal Cutter

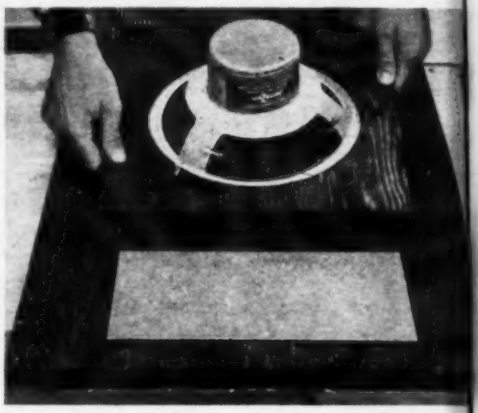
You'll strip off plastic insulation quick as a wink—clean and smooth—with the patented wire-stripping notch of this CHANNELLOCK Diagonal Cutter. And you'll like the handy long reach . . . the precision-matched, hand honed cutting edges, too; A versatile cutter for electrical, radio, TV, Hi-Fi and all other types of electronics work. Comfortable, blue-plastic grips. Top quality, polished forged steel. Ask your tool supplier for a CHANNELLOCK No. 728 Diagonal Cutter. If he's out of them, ask him to order one for you.

Write for Catalog of Complete Line of Pliers

CHAMPION DEARMENT TOOL COMPANY
Meadville 3, Pennsylvania

Hi-Fi Woofer

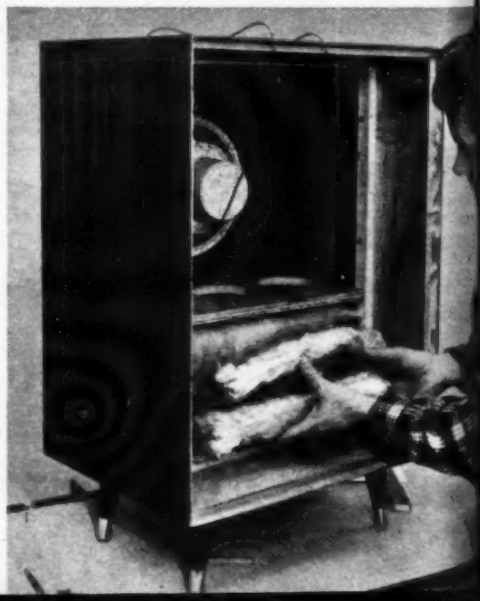
[*Continued from page* 120]

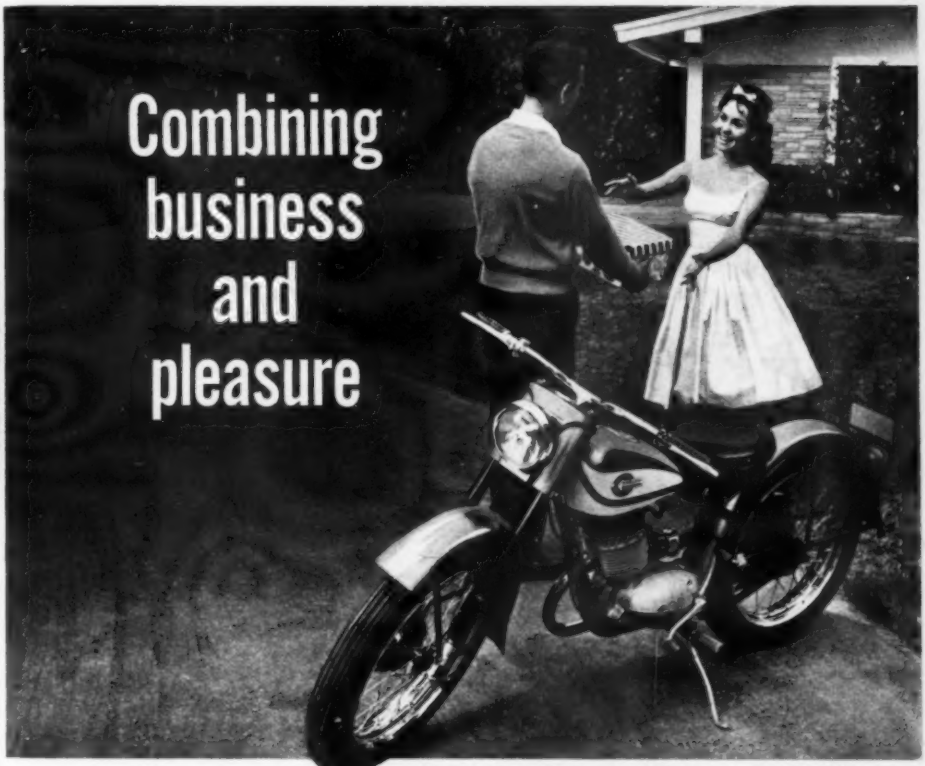


WITH SPEAKER in place, the speaker support frame is screwed to front panel of cabinet.

Use screws *and* glue to prevent distorting resonances. Also, use the sealing material (that comes with the woofer) to close air leaks between woofer mounting flange and cabinet. Finally, completely fill both woofer partitions with loosely-packed Fiberglas. •

PACK Fiberglas matting into both chambers. Securing back panel in place completes job.





on a new, lightweight HARLEY-DAVIDSON Super-10*

Deliveries, messenger service, whatever it may be, the Super-10 turns work into play. And what makes it doubly exciting is that you quickly pay for the economical Super-10 with the money you earn while you're having fun.

Easy to ride, easy to handle . . . great for traffic . . . single-unit engine and transmission with plenty of GO! Up to 80 miles to the gallon . . . that's money in your pocket!

Comfort? It's the most! The Super-10 features a form-fitting, bucket saddle. Looks? Just your dish. Two-tone finish: Birch White tank panel with Hi-Fi Red, Hi-Fi Blue, Hi-Fi Green or Skyline Blue. Specially treated to resist rust and corrosion.

Ask your Harley-Davidson dealer for a demonstration ride. He'll also fill you in on his low down payment and easy-pay plans. Or mail the coupon for a colorful, detailed folder.

*The Super-10 is also available in a 5-hp model to comply with various state laws.

HARLEY-DAVIDSON MOTOR CO.
Dept. MI, Milwaukee 1, Wisconsin

Please send me all the facts on the Harley-Davidson Super-10

Name.....Age.....

Address.....

.....

NEW MULTI-COLOR aerosol-packed spray paint, Morflek, dispenses four colors at once.

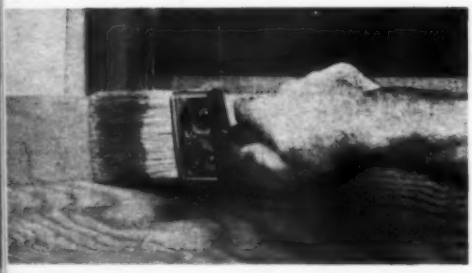
Benjamin Moore & Co., 511 Canal St., N.Y.C. 13

NEW PAINTING PRODUCTS

Pre-dried paints are now made by the Morgan Adhesive Co. of Stow, Ohio. The paint, on paper, is cut to fit the wall. The protective paper is then stripped off, exposing an adhesive surface. . . . A flexible vinyl wall covering which can be applied like wall paper is marketed by the General Tire and Rubber Co. of Akron, Ohio. . . . A folding metal container for protecting the bristles of cleaned paint brushes is available from George Playter, 318 Haledon Ave., Paterson 2, N. J. . . . Cork-Tex is a vinyl-covered cork-based wall covering a quarter-inch thick. It's available in rolls up to 72 feet long and is 4 feet wide. Bond Crown and Cork Co. of Chicago puts it out. . . . A kit for "antique-ing" furniture is put out by Breinig Bros. Write to them at 117 Grand St., Hoboken, N. J., for further details. . . . Kil-Sect, a paint put out by the Consolidated Paint and Varnish Co. of 505 Fifth Ave., N.Y.C. 17, is said to kill any insect that touches a surface covered with this paint. It sells for about $7 per gallon. . . . A paint and varnish remover especially compounded for epoxy, urethane and regular marine finishes is marketed by the Savogran Co., Box 58, Norwood, Conn.

ONE-COAT PAINT, especially made for rough walls; semi-paste, needs no stirring.

E. I. DuPont & Co., Wilmington, Del.



NEW LINE of brushes, to four-inch width, use undyed, natural finish white bristles.

Glidden Co., 900 Commerce Bldg., Cleveland 14

SPLASH-PROOF mixer, fits electric drill, mixes heavy stuff such as putty, also paint.

Jiffy Mixer Co., 515 Market St., San Francisco 5

New Du Pont LUCITE® House Paint adds years of beauty... saves real money

"Lucite" makes the difference... and only Du Pont makes "Lucite"

Outstanding durability, superior blister-resistance, easy application make Du Pont "Lucite" the greatest house paint discovery in 30 years.

OUTLASTS ORDINARY PAINTS. Du Pont research chemists tested new "Lucite" Acrylic House Paint for years in all kinds of weather, in all parts of the country. Result: proof that "Lucite", applied according to directions over Du Pont Blister-Resistant Primer, can actually last 50% longer than conventional house paints.

COMBATS BLISTER PROBLEM. Moisture blistering, once the homeowner's most serious problem, has been solved. Tests show that "Lucite" over Du Pont Blister-Resistant Primer, on new wood or old surfaces from which the paint has been removed, effectively resists blistering.

GOES ON EASILY, DRIES FAST. Never before has an exterior house paint been so easy to apply. New "Lucite" flows on without effort. Dries quickly. Ideal for wood and masonry surfaces.

Send for new 12-page booklet, "How to Get Extra Years of Beauty from Your Next House Paint Job." Write Du Pont Finishes Div., Dept. MI-66, Wilmington 98, Delaware. Or ask your Du Pont Dealer. He's in the Yellow Pages of your telephone directory.

Buy the paint that's worth the work... the beauty lasts

DU PONT

REG. U. S. PAT. OFF.

Better Things for Better Living

...through Chemistry

SERVICING THE Studebaker Lark

Some tips on the care and feeding of the Lark, Studebaker-Packard's compact car.

By Frederick C. Russell
Member, Society of Automotive Engineers

MOTORISTS who like to judge cars by first kicking the tires will get a favorable impression of the 1960 Lark from the ground up. Right off they'll discover that this perky compact rolls on 15-inch tires as compared with the 13-inch skates of others. It is typical of what has helped make this job the ace that pulled Studebaker-Packard out of a hole.

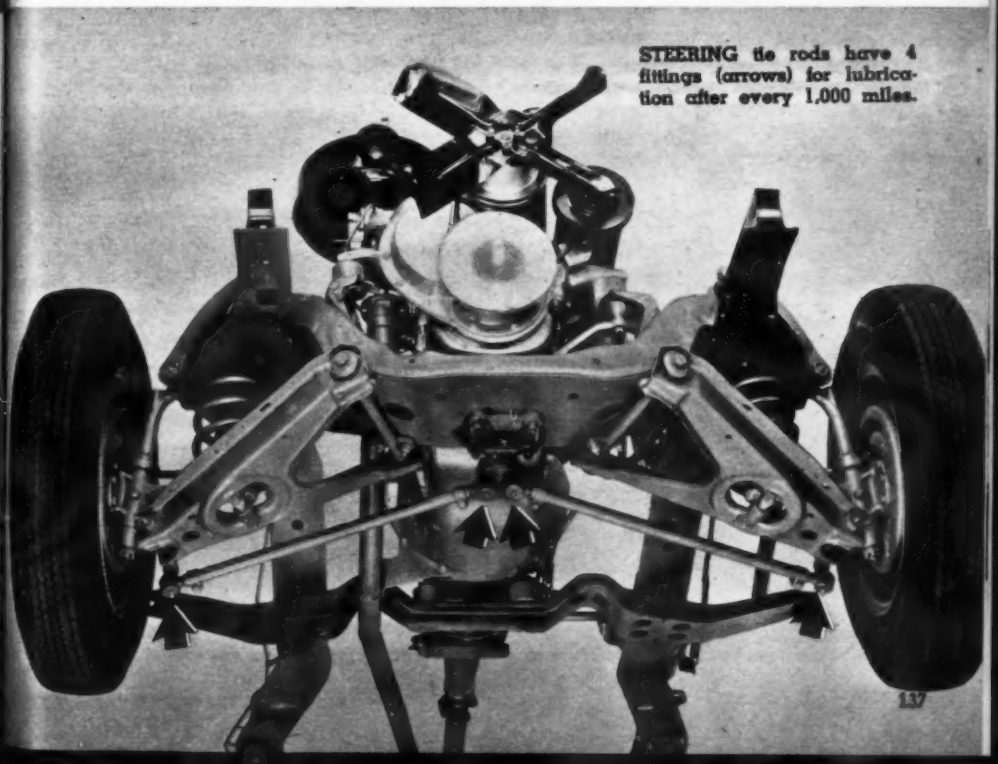
A 5.90x15 tire makes 100 fewer revolutions per mile than a 6.00x13 tire. That's a saving of 10,000 revolutions every 100 miles. It also amounts to 22.7 per cent more tire tread in contact with the road for better traction, not to mention less chance of the tires becoming overloaded. The Lark can thus use 11-inch brakes—an important factor in checking brake fade.

For economy, Larks are available with overdrive and the engine can be a choice of the 90-hp six, the 180 V-8 or the hopped-up 195-hp V-8. The optional automatic transmission is a three-forward-speed job which means better economy in up- and down-hill driving when the owner prefers not to use high. The wide range of choice for the Lark means that a buyer may have quite a gig before he signs on the dotted line. He must, therefore, give more thought to car care.

The Lark requires some of the attention needed to get best results from a conventional-size car. There are dual floats in the new carburetor, for instance. These can, however, be adjusted easily by bending the float arm levers. It's important that the carburetor be in an upright position when doing this little job. If the engine doesn't run right when the car is turning sharply left or right, the floats are binding against the bowl wall.

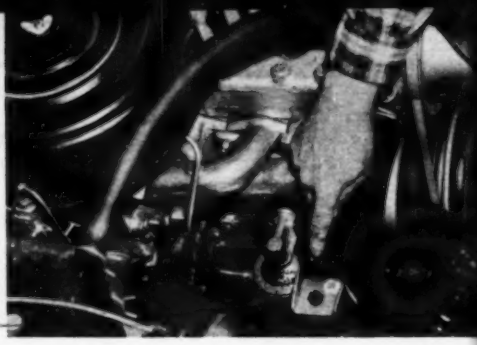
Timing marks will be found on the damper at the front of the crankshaft, and note especially that ignition timing for the 60S (the six-cylinder) engine is two degrees BTDC (before top dead center) while that for the 60V (eight-cylinder) is four degrees BTDC. The distributor rotates counterclockwise and if you are setting breaker points be sure to give them .020-inch on the six as against .016-inch on the V-8.

For proper break-in, Studebaker recommends varied speeds. This just about covers it. This means no pokey driving and no sustained high speeds for the 1,000-mile run-in. For all Studebaker engines, oil from containers marked MS is preferred, but it can be in combinations with oils from cans marked MM, ML or DG. But Lark owners are cautioned *not* to use oil labeled ML only. Multi-viscosity oils may be used if temperatures are 32° or more above zero. For hard service in hot weather, this may need to be SAE 20W-40. SAE 5W-20 or SAE 5W is the choice for operation below minus 10 degrees.



STEERING tie rods have 4 fittings (arrows) for lubrication after every 1,000 miles.

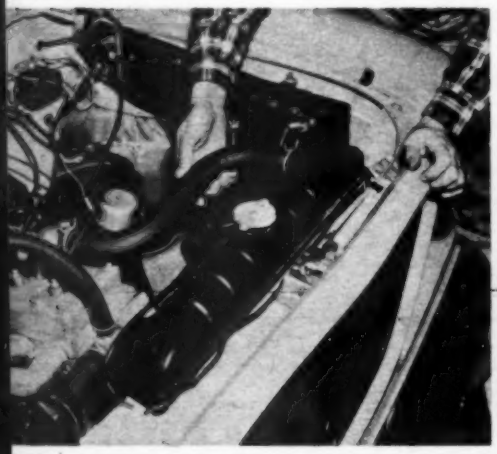
FRONT END is raised by placing a jack just inside the right or left bumper bar.



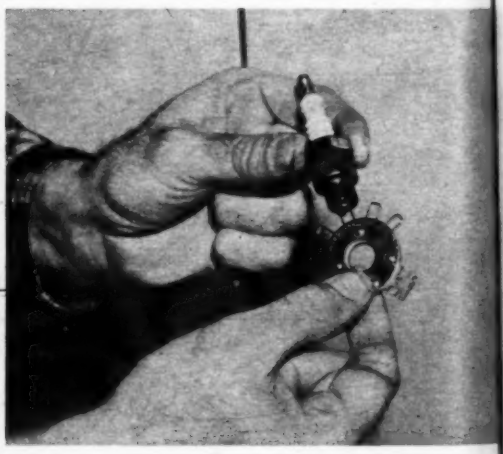
ENGINE MOUNTS are cushioned with rubber to decrease the effects of vibration.

RADIATOR CAP must be clean and tight: there's 10 to 15 lbs. pressure in system.

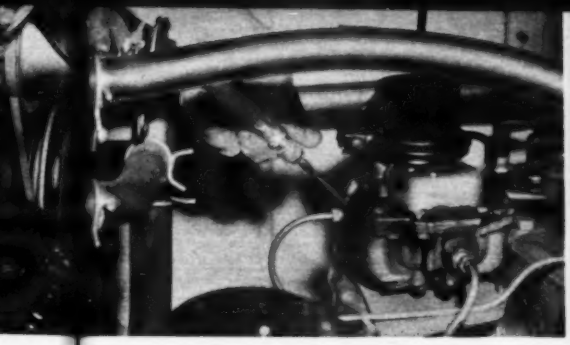
FRONT stabilizer bar may not be there since it's optional equipment on the Six.



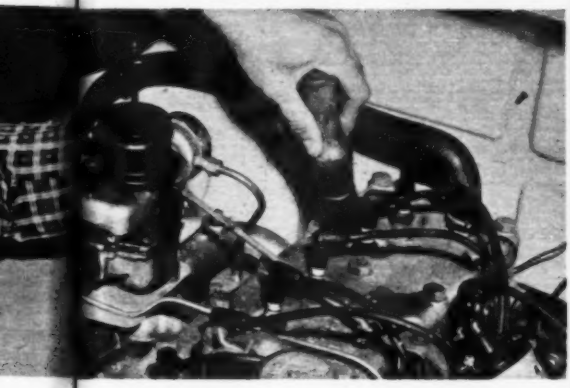
UPPER radiator hose has a double turn: check it occasionally for signs of wear.



LARK SIX plug gap is .028 to .033 inch, less than the gap used with most engines.



SET idle speed slightly above 550 rpm in Lark which has automatic transmission.



ALWAYS clean the area around the plug ports before removing plugs for servicing.

A few pointers will help a lot in keeping the Lark engines perking efficiently. There's an air filter in the oil breather tube which should be washed in clean kerosene, dried and then wetted with light engine oil before replacement. To remove this little element, take out the cotter pin which holds it in the lower end of the breather tube and pull it up with a wire hook. Then there's the manifold heater valve which should be kept from sticking by applying a mixture of kerosene and soda, and which may need tightening. Do this when the engine is cold and tighten the retainer nuts evenly as well as securely.

Studebaker stresses making sure the throttle is fully opened when the accelerator is all the way to the floor. Valve tappet clearance on the six-cylinder engine should be set for .018 inch for intakes and [*Continued on page* 152]

SERVICE TIPS

from Detroit

A new resilient synthetic rubber-tipped fuel inlet needle with a slightly larger seat is now available to correct certain flooding conditions on current Chrysler and Imperial models equipped with AFB four-barrel carburetors.

Owners of Studebaker-Packard products who experience engine "stumble" on acceleration, or engine stoppage after the first start, should inquire about two new kits the company has made available to improve acceleration characteristics and choke operation.

The Corvair generator, which rotates in a direction opposite to that of generators on standard passenger cars, necessitates having a reverse pitch on its pulley fan blades. Reverse pitch causes the air to flow from the commutator end of the generator and exhaust at the pulley end, keeping a safe operating temperature at the commutator end.

A new spark plug with zinc plating on its shell is now being used on 1960 Ford engines. This is strictly a product improvement and does not affect heat range or the Champion spark plug number.

A damaged push rod in your 1960 Plymouth six-cylinder engine can prevent oil from reaching the rocker shaft, rocker arms and tappets. If a rear camshaft bearing has turned in the block, determine if a new one will fit tight enough when installed to prevent a recurrence. If not, you'll have to have the outside diameter of the new bearing coated with a high tin-content solder prior to installation.

Valiant owners should make sure the fuel cap retaining collar is properly soldered to the tank fill pipe so that gasoline fumes cannot enter the car via the trunk compartment.

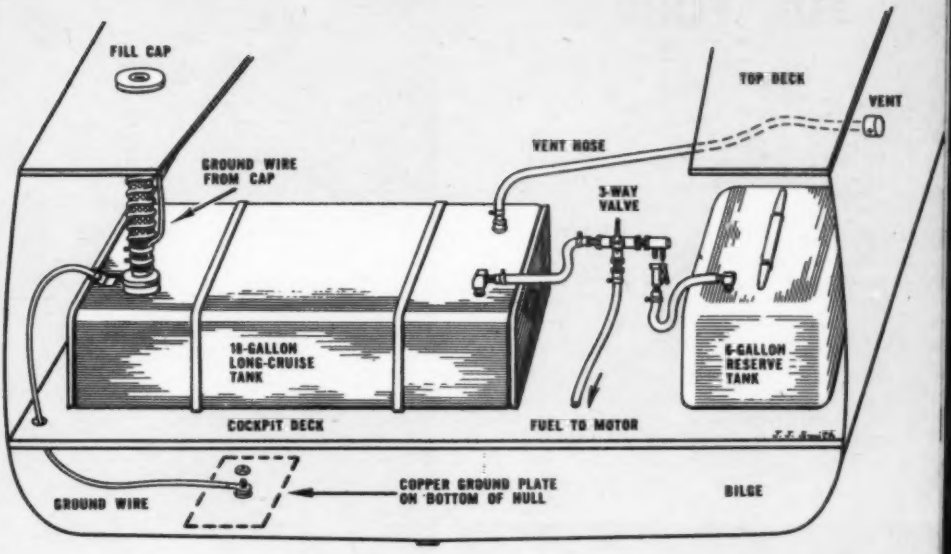
FEWER FUEL STOPS

Install a large, permanent fuel tank for your outboard and cruise for hours on one filling.

By Jack Smith

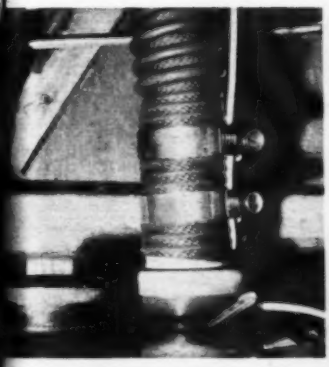
TANK has rubber hold-down straps which also raise it above floor. Conversion kit and three-way valve are in the foreground.

DECK FITTING is installed in a 2¼-in. hole bored with an expansive bit. Locate it so that spilled fuel flows overboard.



I LIKE to travel in my outboard cruiser. Two trips from New York to the Great Lakes and Canada have each been over 1,000 miles and others along the coast have involved hundreds of miles of cruising. But one thing that always peeved me was filling those small gas tanks repeatedly. I often vowed that I would install a large-capacity, inboard-type fuel tank—and never got around to starting with the project.

Tempo Products Co., 2062 E. 70th St., Cleveland 3, Ohio, got me off my haunches by announcing a simple conversion kit for any one of their large tanks. An 18-gallon tank to fit the available space in my 19-foot Cruisers, Inc. hull was quickly selected and plans were made to link it to one of my six-gallon tanks for [*Continued on page* 150]

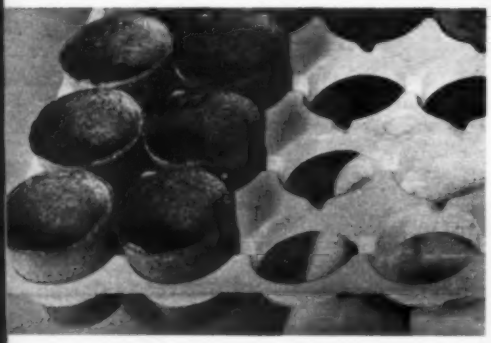


GROUND WIRE runs from deck fitting to metal fill pipe in tank (left). Bared ends are bent inside flexible hose and clamps secure it. Wire is then continued from tab on tank to ground plate bolt in bilge (center). The plate is shown installed on outside of hull at right.

FOR YOUR GARDEN

TWO booklets, "Pruning Guide" and "How-to Hints for Good Gardening," are available free from Stanley Tools, New Britain, Conn. . . . White plastic plant markers in nine styles to meet every garden need are made by Lifetime Markers, Box 158, Milford, Mich. . . . Flower picker shears by Reed Enterprises, 718 N. Oakley St., Saginaw, Mich., cut and hold stem, are $2.25, ppd. . . . Aluminum vine holder kit made by Tal-Mir Corp., Box 37, Oswego, Ore., keeps vine crops and flowers off ground, is $1.95, ppd.

STAPLE burlap around a young tree to prevent rabbits from gnawing bark.
Arrow Fastener Co., Inc.



PLASTIC TRAY and 24 peat moss pots to hold bedding plants sells for $2.49.
Willis-Reynolds Corp., 321 Ballard St., Lebanon, Ind.

BASKETS are made of polyethylene plastic, come in red, yellow, pink, turquoise.
Federal Tool Corp., 3600 W. Pratt Blvd., Chicago 45

CANDLES in colored glass holders make decorative lights for garden, cost $2.95.
Candles of the Month Club, Box 6552, Houston 5, Tex.

WHAT COLOR FILM?

By Walter O. Koehler

COLOR with a difference—that's the key to today's unprecedented boom in amateur photography. But the very abundance of new films is likely to prove confusing, even to the experienced photographer, for there's no "best" film for every camera and every situation. Each type has its advantages and limitations.

Color films can be divided into two basic categories—*reversal* and *negative*. When reversal film is developed, it produces a transparency. Light passing through the film reveals the image in its natural colors. The transparency must be held against the light or placed in a viewer or projector.

While reversal film can be used to produce either transparencies or prints, this versatility just comes naturally to the color negative. A single negative will yield a color print, a black-and-white print or a color slide.

Reversal film is the older and more popular of the two types. In its most familiar form, the 35mm slide, each frame is inserted in a 2x2-inch cardboard mount. A sharp 35mm slide can easily be projected to a bright 30x40-inch picture in the average living room. Projected color transparencies have a brilliance which can't be approached by any other method of viewing.

Reversal films come in an assortment of types, each possessing some definite advantages. The owner of a 35mm camera, for example, can make transparencies from Kodachrome, Anscochrome, Ektachrome, Super Anscochrome or the new High Speed Ektachrome.

The various reversal films differ from each other in two important respects: speed and color balance.

Film speed is the term used to indicate the amount of light required for a satisfactory exposure. It is usually designated by an ASA (American Standards Association) number. Kodachrome, the slowest of color films, has an ASA number of 10 and requires a lens opening of f-6.3 at a shutter speed of 1/50th of a second on a sunny day. At the other end of the scale, High Speed Ektachrome, with its exposure index of ASA 160, permits the lens to be stopped down to f-16 and the shutter speed raised to 1/250th under the same conditions. Anscochrome and Ektachrome are rated at ASA 32, while Super Anscochrome has a speed of ASA 100.

Slower films still have superior resolution and the ability to record details with maximum sharpness. Their grain structure is also finer, preventing the image from turning into a pattern of dots when greatly magnified. And they cost

Roll Film	Type	Sizes, Prices	Balanced For	Index Asa[1]	Flash Guide
Anscochrome Daylight	Reversal	135, 20 exp. ..... $2.05 135, 36 exp. ..... 2.85 828 ..... 1.00 127 ..... 1.35 120 and 620 ..... 1.35	Daylight	32	85[2]
Super Anscochrome Daylight	Reversal	135, 20 exp. ..... 2.35 135, 36 exp. ..... 3.30 127 ..... 1.75 120 ..... 1.75	Daylight	100	170[2]
Super Anscochrome Tungsten	Reversal	135, 20 exp. ..... 2.35 120 ..... 1.75	3200 K	100	220[3]
Ektachrome Daylight	Reversal	135, 20 exp. ..... 2.05 828 ..... 1.00 127 ..... 1.35 120 and 620 ..... 1.35	Daylight	32	90[2]
Ektachrome Type F	Reversal	135, 20 exp. ..... 2.05 828 ..... 1.00 127 ..... 1.35 120 and 620 ..... 1.35	Clear Flash	—	120
Ektachrome E-3	Reversal	120 and 620 ..... 1.60	Daylight	50	110[2]
High Speed Ektachrome Daylight	Reversal	135, 20 exp. 2.50	Daylight	160	200[2]
High Speed Ektachrome Type B	Reversal	135, 20 exp. 2.50	3200 K	125	240[3]
Kodachrome Daylight	Reversal	135, 20 exp. ..... 2.05 135, 36 exp. ..... 2.85 828 ..... 1.00	Daylight	10	50[2]
Kodachrome Type F	Reversal	135, 20 exp. ..... 2.05 135, 36 exp. ..... 2.85 828 ..... 1.00	Clear Flash	—	95
Kodachrome Professional	Reversal	135, 36 exp. 2.85	3400 K	16	80[3]
Kodacolor	Negative	135, 20 exp. ..... 2.05 828 ..... 1.00 127 ..... 1.35 120 and 620 ..... 1.35 116 and 616 ..... 1.85	Daylight or Clear Flash	32	120
Sheet Film					
Anscochrome Daylight[4]	Reversal	4x5 ..... 7.69 5x7 ..... 11.77 8x10 ..... 26.30	Daylight	32	85[2]
Anscochrome Tungsten[4]	Reversal	4x5 ..... 7.69 5x7 ..... 11.77 8x10 ..... 26.30	3200 K	25	110[3]
Ektachrome Daylight E-3[4]	Reversal	2¼x3¼ ..... 3.95 4x5 ..... 8.09 5x7 ..... 12.45 8x10 ..... 27.42	Daylight	50	110[2]
Ektachrome Type B[4]	Reversal	2¼x3¼ ..... 3.95 4x5 ..... 8.09 5x7 ..... 12.45 8x10 ..... 27.42	3200 K	32	130[3]
Ektacolor Type L[4]	Negative	2¼x3¼ ..... 3.95 4x5 ..... 8.09 5x7 ..... 12.45 8x10 ..... 27.42	3200 K	16	NR[3]
Ektacolor Type S[4]	Negative	4x5 ..... 8.09 5x7 ..... 12.45 8x10 ..... 27.42	Clear Flash	—	120[2]

Notes:

NR—Not recommended
SO—Special order
Prices subject to regional variations

[1]With recommended light source
[2]With blue flash bulbs, 5B or 25B
[3]With recommended filter and 5 or 25 bulbs

Processing	Cost Per Print	Extra Transparencies
135, 20 exp. ..... $1.75 135, 36 exp. ..... 2.90 828 ..... 1.10 127 ..... 1.60 120 and 620 ..... 1.75	35mm ..... .35 828 ..... .35 127 ..... .45 120 ..... .45 620 ..... .45	None
135, 20 exp. ..... 1.75 135, 36 exp. ..... 2.90 127 ..... 1.60 120 ..... 1.75	35mm ..... .35 127 ..... .45 120 ..... .45	None
135, 20 exp. ..... 1.75 120 ..... 1.75	35mm ..... .35 120 ..... .45	None
135, 20 exp. ..... 1.75 828 ..... 1.10 127 ..... 1.60 120 and 620 ..... 1.75	35mm ..... .45 828 ..... .45 127 ..... .45 120 and 620.. .45	None
135, 20 exp. ..... 1.75 828 ..... 1.10 127 ..... 1.60 120 and 620 ..... 1.75	35mm ..... .45 828 ..... .45 127 ..... .45 120 and 620.. .45	None
120 and 620 ..... 1.40	120 and 620.. .45	None
135, 20 exp. 1.75	35mm ..... .45	None
135, 20 exp. 1.75	35mm ..... .45	None
135, 20 exp. ..... 1.75 135, 36 exp. ..... 2.90 828 ..... 1.10	.35	None
135, 20 exp. ..... 1.75 135, 36 exp. ..... 2.90 828 ..... 1.10	.35	None
135, 36 exp. 2.90	.35	None
All Sizes ..... .90	2x (35mm, 828 negatives) .... .23 3x (standard sizes) ..... .32 Other sizes.. .45	35mm ..... .25 828 ..... .25 127 ..... .35 120 ..... .35 620 ..... .35
4x5 ..... .65 per sheet 5x7 .....1.25 per sheet 8x10 .....1.75 per sheet	4x5 ..... 1.00 5x7 ..... 1.50 8x10 ..... 3.00	None
4x5 ..... .65 per sheet 5x7 .....1.25 per sheet 8x10 .....1.75 per sheet	4x5 ..... 1.00 5x7 ..... 1.50 8x10 ..... 3.00	None
2¼x3¼.... .65 per sheet 4x5 ..... .85 per sheet 5x7 .....1.25 per sheet 8x10 .....1.75 per sheet	2¼x3¼ ..... .60 4x5 ..... 1.00 5x7 ..... 1.50 8x10 ..... 3.00	None
2¼x3¼.... .65 per sheet 4x5 ..... .65 per sheet 5x7 .....1.25 per sheet 8x10 .....1.75 per sheet	2¼x3¼ ..... .60 4x5 ..... 1.00 5x7 ..... 1.50 8x10 ..... 3.00	None
2¼x3¼.... .65 per sheet 4x5 ..... .65 per sheet 5x7 .....1.25 per sheet 8x10 .....1.75 per sheet	2¼x3¼ ..... 2.00 4x5 ..... 2.00 5x7 ..... 3.00 8x10 ..... 5.00	SO
2¼x3¼.... .65 per sheet 4x5 ..... .65 per sheet 5x7 .....1.25 per sheet 8x10 .....1.75 per sheet	2¼x3¼ ..... 2.00 4x5 ..... 2.00 5x7 ..... 3.00 8x10 ..... 5.00	SO

[1]Box of 10 sheets. Other sizes available on special order
[2]Smallest available print
[3]In quantities of 2 to 9. Additional charge of $7.50-$10.00 for first print

less than the high-speed variety.

Fast color films make it possible to shoot when the light is too dim for adequate exposure with other emulsions. When the scene includes both brightly lighted and shaded portions, high-speed films lighten the shadows and pick out details that would be nothing but dark masses if photographed with slower materials.

Each of the five reversal films comes in at least two versions to provide the correct color balance for the type of light to which it is exposed. Exposing film to the wrong light source destroys the color balance. Shooting with a daylight-type film under photoflood illumination produces a reddish or yellowish transparency. If a film balanced for artificial light is used in daylight, the picture will have a strong blue cast.

Should the amateur photographer find himself with a camera loaded with film made for artificial light, he can mount a correcting filter in front of the lens to permit daylight exposures. When daylight film is used indoors, blue flash bulbs or electronic flash will maintain the proper color balance.

Speed and color balance are definite qualities which can be accurately measured. Color rendition, on the other hand, is strictly a matter of opinion. Kodachrome leans toward the blue end of the color scale. Ektachrome yields pictures with stronger reds and yellows. Anscochrome trans-

Movie Films	Size	Asa Daylight	Photoflood	Length	Price	Processing
Anscochrome Daylight	16mm	32	12[1]	100 ft. roll	$ 8.00	$4.25
				200 ft. roll	13.55	8.50
				50 ft. magazine	6.60	1.70[2]
Anscochrome Tungsten (3400K)	16mm	25[1]	32	100 ft. roll	8.00	4.25
				200 ft. roll	13.55	8.50
				50 ft. magazine	6.60	1.70[2]
Super Anscochrome Daylight	16mm	100	40[1]	100 ft. roll	9.20	4.25
				200 ft. roll	15.40	8.50
				50 ft. magazine	7.80	1.70[2]
Super Anscochrome Tungsten (3200 K)	16mm	80[1]	100	100 ft. roll	9.20	4.25
				200 ft. roll	15.40	8.50
				50 ft. magazine	7.80	1.70[2]
Moviechrome Daylight	8mm	20	10[1]	25 ft. roll	2.85	1.75
Kodachrome Daylight	16mm	10	4[1]	50 ft. roll	4.75	2.50
				100 ft. roll	8.00	4.25
				200 ft. roll	13.60	8.50
				50 ft. magazine	6.60	1.70[2]
Kodachrome Type A (3400 K)	16mm	10[1]	16	50 ft. roll	4.75	2.50
				100 ft. roll	8.00	4.25
				200 ft. roll	13.60	8.50
				50 ft. magazine	6.60	1.70[2]
Kodachrome Daylight Dbl. 8	8mm	10	4[1]	25 ft. roll	2.85	1.75
				25 ft. magazine	4.15	1.40[2]
Kodachrome Type A Dbl. 8 (3400 K)	8mm	10[1]	16	25 ft. roll	2.85	1.75
				25 ft. magazine	4.15	1.40[2]

Notes: [1]With recommended filter [2]After refund of magazine deposit

parencies favor pastel shades rather than the bright colors of the Kodak products. It's up to the photographer to decide which colors are most pleasing to him.

Color prints can also be made from transparencies. Special reversal color printing paper yields a print direct from the transparency. Slides can also be copied on color negative material and prints made from the negative. The second method is more economical when several prints must be produced from each transparency.

Kodacolor, the only color *negative* film made in this country, can be exposed by sunlight or clear flash bulbs. No filter is required as correction, for the difference in color temperatures is made *when the film is printed.* Other light sources, such as photofloods or studio lights, require the use of a filter.

The photographer who uses color negative film does not have to make any additional investment for a viewer, projector or screen. All he needs is a roll of Kodacolor and virtually any camera from a $5 box to a $500 miniature.

The one big disadvantage of color negative film is the cost of printing. If all 20 exposures of a 35mm roll are printed, the total cost of film developing and printing will be $7.55, or about 37½ cents per print.

Some photographers will prefer the economy, brilliance and speed range of reversal materials. Others will be sold on the convenience and simplicity of the color negative. In either case they'll find it easier to get top-quality pictures under a wider variety of shooting conditions than ever before. •

How To Use The Abacus

[*Continued from page* 114]

and I just bought him one!" (Good lunch! —Ed.)

Relax friends, that astute Oriental is right on the ball with his abacus—for that's what the contraption is called. It's an ancient and honorable calculating machine and in the hands of a skilled operator it *can actually outperform a modern adding machine!*

Basically, the abacus consists of a wooden frame with six or more vertical wires or rods. Ten beads are strung on each wire. With a six-wire abacus, you can add to 999,999; with a seven-wire frame, you can add to 9,999,999.

As on an adding machine, the first row at the extreme right counts for units, the second row from the right for tens, the third row for hundreds and so on. So, the first thing is to place the abacus in front of you with all the beads pushed away from you or in the "up" position. One bead "down" on the extreme right counts for one, two beads down means two, and so on.

If you move ten beads down in the first row, you have a sum of ten. But, because tens are in the second row, we can move down a *single* bead in the second row (for ten) and move all the beads to the "up" position in the first row. In other words, ten beads down in the first row means ten, or one bead down in the second row and no beads down in the first row, also means ten.

Suppose we have five beads in the units column and we want to add seven. Now then, there are only five beads left in the units column so what do we do? How can we add seven? What is ten minus seven? Three? Right! So we move down a bead in the tens column or rod (which counts for ten) and move back (up) three in the units column. In other words, we have subtracted three from ten and have so gotten the seven which we want to add to our original five. Our answer is 12: one bead in the tens column and two beads in the units column. In brief, that is the principle of the abacus. With it you can add, subtract and even multiply and divide.

The abacus which we are explaining how to use is a simplified version but it works on the same principle as the Chinese abacus. The Japanese have a slightly different type which they call a *soroban*. This machine has an extra horizontal crossbar. All beads above the bar count for five. The calculations are done by moving the beads from the upper part of the soroban down to the middle bar and from the lower part of the soroban up to the middle bar. Calculations are the same in either system, but the Japanese system is somewhat faster because instead of having to count five beads you can move a single bead to count as five.

Abacus kits, sorobans and finished abaci can be purchased from the Edmund Scientific Co. in Barrington, N. J. The one shown being used is a six-wire abacus; it is made with a finely finished walnut frame and sells for $4.95.

Follow the simple steps shown in the drawings and we promise that you will be able to use the abacus at the end of 15 minutes. •

Golden Hammer Awards

[*Continued from page* 127]

paign, Ill. . . . Roger Grosskreutz, Sharwand, Wis. . . . Harry Dorfman, Fort Lee, N. J. . . . Ralph Foster, San Diego, Calif. . . . Ida Privrat, Long Island City, N. Y. . . . Owen Knox, Denton, Mont. . . . George F. Gressle, Granville, Ohio. . . . Jerrie Crawford, Leonia, N. J. . . . Albert Katz, Baltimore, Md. . . . Russell D. Osterhout, Phoenix, Ariz. . . . Glenn Bottrell, Brunswick, Mo. . . . Hoy E. Furr, Fort Smith, Ark. . . . Cpl. Allen I. Atrill (RCAF), Middleton, N. S., Can. . . . Al Burghardt, Detroit, Mich. . . . Howard F. Morash, N. S., Can. . . . Gene Steele, Chino, Calif. . . . Thomas W. Watts, Columbus, Ohio. . . . Harvey M. Meighan, Willowdale, Ont., Can. . . . Raymond T. Smith, Lenoir, N. C. . . . Irving H. Parker, Jr., Cranston, R. I. . . . Eugene Wisniewski, Toledo, Ohio. . . . Harold R. Cook, Columbus, Ohio. . . . J. H. Binnie, Chilliwack, B. C., Can. . . . Dale D. Drake, Rock Island, Ill. . . . Robert W. Schuur, Westlake, Ohio. . . . L. J. Carlin, Napa, Calif.

The following craftsmen have been awarded CERTIFICATES OF MERITS for their projects:
Gerald F. Butler, Nahant, Mass. . . . Franklin J. Cortese, Houston, Pa. . . . M/Sgt. Millard L. Hart, Rialto, Calif. . . . Hayden Ricker, Tampa, Fla. . . . Richard O. West, Danville, Va. . . . Pat Jones, Three Forks, Mont. . . . Frank Ambrose, Joliet, Ill. . . . Floyd C. Rush, M/Sgt., USAF, Eglin AF Aux Fld No. 9, Fla. . . . Kenneth C. Hughes, Metairie, La. . . . F. Marlin Knisely, Holsopple, Pa. . . . Lloyd Young, Norristown, Pa. . . . Gilbert Q. Crosley, Carlisle, Pa. . . . Bernard E. Drauch, E. Chelmsford, Mass. . . . William A. Opas, Bridgeport, Conn. . . . M. W. Morton, Seminole, Okla.
Look for names of more winners next month.

[*Continued from page* 118]

bent upward to form gripping flanges while the rear edge forms the supporting flange that is screwed to the back wall of the console.

Use easily identified colored wires when wiring the receptacles, switch, timing control, and neon lights. All wires emerge from the chassis through a grommeted hole in the upper left-hand corner and follow the console contours to their various terminals.

Certain wiring precautions should be carefully observed: (1) to avoid the danger of shock, do not permit any bare wires to terminate at the metal of the cabinet or the chassis; (2) use a pair of two-lug terminal strips to support the big timing capacitors; and (3) solder all connections except where a component has screw terminals.

Note that the power terminal inside the console is a Gem triple-receptacle that allows for the Ti-Mite switch to be *Off* without affecting the clock or utility outlet power.

Testing and calibration. By using an ohmmeter, the presence or absence of wiring errors, short and open circuits, and defective components can be quickly determined.

Plug in the electric clock and the utility receptacle to check the clock's operation and to see that the neon light of the UTIL receptacle can be turned on and off by the main switch.

Now insert the Ti-Mite plug in the remaining outlet of the triple receptacle box; switch it on and make sure the bull's-eye is glowing. This light should glow regardless of the position of the main switch when the timer's own switch is turned on.

Assuming you have a two-minute Amperite delay relay in its octal socket, depress the main switch to the TIMER position. The neon jewel over Unit No. 1 should glow, but none of the others. After two minutes, the solid *clack* of the 117-volt relay should be heard and the jewel associated with Unit No. 2 should light (No. 1 jewel should remain on throughout). With the control potentiometer rotated fully counterclockwise, Unit No. 2 should remain energized for about 1¾ minutes and then shut off; at the same instant Unit No. 3 should be energized. Thus, until they are turned off with the main switch after the timing interval is over, Units No. 1 and No. 3 should remain powered.

Now you can calibrate the Unit No. 2 timing circuit for the elapsed time desired (up to 20-25 minutes) by rotating the control knob to more advanced positions clockwise and noting the timing interval on the clock.

The bull's-eye reminds you of certain necessary steps. Since the Ti-Mite may be *On* at the time of setting up for the night, the bull's-eye tells you that it *is* on and must be turned off. When you retire, the electric clock should be running and the Ti-Mite motor should be operating, but *all* indicator lights should be out, including the utility neon. •

PARTS LIST

CABINET & CHASSIS

Console—6½"x7-5/16"x11-1/16", Bud type C-1586B.
Chassis—2⅛"x3"x5¼" (½ of Minibox) Bud type CU-3006.
Ti-Mite shelf—Cut from remaining half of Minibox.

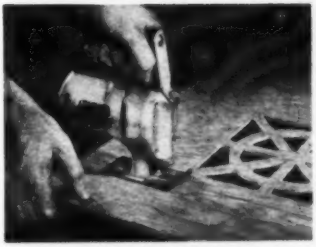
ELECTRICAL PARTS

4	AC receptacles, Amphenol, 1-1/16" dia.
1	Toggle switch, double-pole, double-throw, Lafayette, SW-22.
4	Miniature neon units, Lafayette, MS-478.
1	Bull's-eye neon assembly, 1" type, Dialco for use with neon lamp NE-51.
1	Gem, 3-receptacle outlet box.
1	Paragon Ti-Mite timer.
6 ft.	Heavy-duty appliance cable with plug.
3	AC plugs for Gem outlets.
2 ft.	No. 14 zip cord for receptacle connections.
1	Electric clock.

ELECTRONIC PARTS

1	Amperite delay relay, 115N0180 (3 min.) or 115N0120 (2 min.) (RY-1).
2	Octal Bakelite 1" tube sockets for chassis mtg.
1	Tube, 117L7/M7.
1	Relay, 110 V AC coil, SPDT, Potter & Brumfield, MP5A with 8 amp contacts.
1	Capacitor, 300 mfd at 150 V, Aerovox Dandee (C1).
1	Capacitor, 16 mfd at 150 V, Sprague tubular.
5	Resistors, 100K ohms, ½ w (R1, R2, R4, R5, R6).
1	Potentiometer, 1 megohm linear, IRC Q 11-137.
1	Relay, 10,000 ohm coil, SPDT, Potter & Brumfield, LB-5 (specify 10,000 ohms).

Photographed at Florida's Silver Springs



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[*Continued from page* 141]

THREE-WAY VALVE. Fuel hose at the left comes from large tank, one at right is from small tank. The center hose leads to motor.

a total capacity of 24 gallons. Within hours after delivery, the installation was complete. One thing bears consideration: Any large tank should be located so that the weight doesn't materially affect the trim of the boat. I made sure of this before I put the 24 gallons in the stern but it easily could be too much in another boat.

The conversion kit, consisting of deck fitting, flexible neoprene fill hose, metal fill tube to extend to the bottom of the tank, vent fittings, vent hose and stainless steel clamps, costs $29.95 and is easily installed. You bore a large hole for the deck fitting, bore a small one high on the side of the hull for the tank vent and hook up the hoses. The fuel line to the motor comes from your existing tank. The next step is grounding.

Grounding is necessary in a permanent tank installation to carry off the static electricity which, when you're fueling, could cause a spark that would ignite the vapors. The ground wire is installed in two lengths: One leads from the deck fitting to the metal tube in the tank and the other is soldered to a tab on the tank and bonded directly to the hull if the hull is metal. In a wooden hull, a copper ground plate must be installed on the bottom so that it is in contact with the water. This plate can be flashing such as used in house construction and should be at least six inches square. I used an eighth-inch thick sheet, beveled the edges, drilled and countersank holes for half-inch flathead bronze screws around the outside and installed a silicon bronze carriage bolt in the center, soldering it for a tight seal. The plate was then coated with bedding compound and the carriage bolt was passed through a tight-fitting hole in the bottom of the boat. After securing it with a bronze washer and nut on the inside, the screws were driven in on the outside. In salt water, bronze fastenings should be used so that they will not be destroyed by galvanic action. Hooking up the ground wire to the carriage bolt completes the job unless you use two tanks.

So that I could switch from one tank to the other or shut off both completely, I installed a three-way valve in the fuel line. The hose to the large tank is fixed and the one to the small tank has an Evinrude quick-disconnect fitting at the end so that it can be removed for filling. Getting the Evinrude fitting into the smaller Mercury hose took some paring and forcing before it was accomplished but it can be done without reaming the hose too much. Now, when I fill both tanks, I have 3¾ hours running time on the large one and 1¼ hours to reach a fuel station before the six-gallon tank runs out. At 24 mph cruising speed, that's 120 miles—a fair haul without a stop. •

AX PROTECTOR

HOSE section will protect the sharp edge of an ax. Slit a short piece lengthwise and slip it on, securing it with a rubber band.

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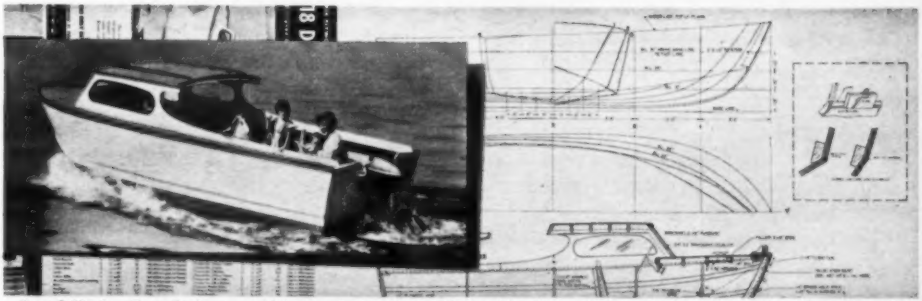

Royal Marine Day Cruiser, an 18-footer designed for all-round family comfort and safety, can take outboards up to 40 hp. With skill and patience, you'll have little trouble building her with big, supple sheets of Royal Marine Plywood.

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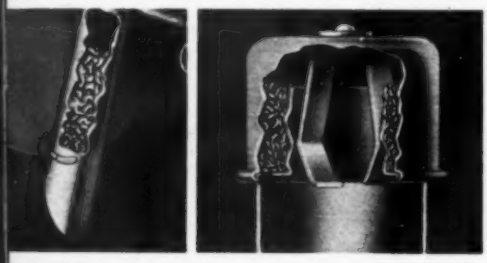
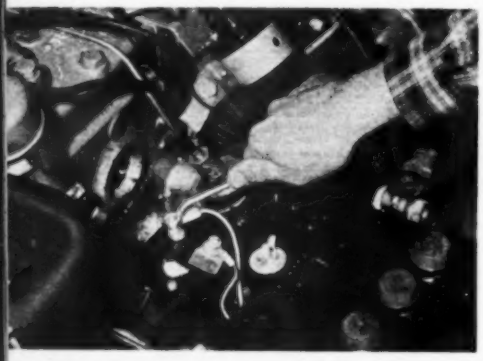
[*Continued from page* 139]



FILTERS for crankcase air are in breather tube (left) and inside the oil filler cap (right).



CHECK generator at regular intervals for normal operation and tighten nuts securely.

exhausts with the engine cold. V-8 engines require clearances of .025 to .027 inch cold. If there's a power brake unit under the hood, remove the plug at the rear of the cylinder and inject an ounce of vacuum cylinder oil every 20,000 miles or every year. Models with Saginaw power steering should have a lube level check of the gear housing every 5,000 miles. Multi-purpose SAE 90 gear lube is needed. Check the level in the cam and lever steering gear every 5,000 miles and check it every 1,000 miles in the case of the jobs with cam and single-lever roller stud gears.

In lubricating the Lark chassis, a point which may be overlooked is the steering bell crank because the fitting is set into the frame and may be covered with road grime. Drivers accustomed to automatic drive cars may easily forget about the clutch release shaft which on conventional shift models has a fitting for 1,000-mile greasing. On models with Flightomatic transmission, the selector lever shaft has a grease fitting down on the steering column under the hood. There are two plugs in the overdrive transmission for checking lube level and filling and two other plugs for draining.

On the six-cylinder distributor, No. 20 engine oil should be put on the felt under the rotor and three to five drops go in the cup on the side. A pat of petroleum jelly on the cam will help check breaker arm block wear and noise. On the distributor for the V-8 models, a few drops of oil should also be put on the felt between the breaker and support plate. This care is required every 5,000 miles with the exception of oil for the shaft oil cup on the V-8 distributor which calls for attention every 1,000 miles. There are two oilers for the generator of both the six- and eight-cylinder motors. The cylinder rod end of the Bendix power steering cylinder needs greasing at the 1,000-mile check.

Larks feature what are known as variable rate front coil springs. This simply means that the space between the coils grows progressively smaller in order to adjust spring reaction to the degree of road shock. Front springs become soft on smooth roads but are ready with suitable resistance when the surface is rough.

Rear suspension is different from conventional leaf spring systems in that the springs are mounted off center with respect to the rear axles. Also, the shock absorbers are angled outward to help check side sway. If a rear spring breaks, the trouble may be due to a loose spring U bolt or spring center bolt. Breakage of a main leaf is likely due to the shock absorbers not doing their job properly. Bottoming that isn't due to poor shocks means that one of the rear springs is broken.

Offbeat is Lark's oil pressure relief valve which should be kept clean. Remove and clean this at least once a year or more

[*Continued on page* 154]

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CHECK THIS LIST

A—wire fencing
B—screening
C—window shades
D—weatherstripping
E—tar papering
F—outdoor decorations
G—repairing shutter slats
H—fastening vines to trellis
I—recovering furniture
J—television antenna wire
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Studebaker Lark

[*Continued from page* 152]

often if sludge is a problem. Studebaker engineers caution against trying to increase oil pressure by stretching the spring. A weak spring should simply be replaced. Keeping the engine clean with the right grade oil, frequent oil changes and a filter change at least every 5,000 miles will head off having to take down the oil pan for removal of sludge.

Lark features some welcome details that save servicing. There is the special accelerator hinge which won't wobble or stick because it is enclosed in rubber. Butyl rubber is being used for engine mounts on the 1960 models. This means that stick shift jobs are not so likely to slip out of gear when old because there will be less engine shake. •

Telephone Secretary

[*Continued from page* 130]

yellow and green. Carefully indicate the position of each wire before detaching it. Note that the phone is fastened to the wall by means of three roundhead screws. Loosen or remove these screws and the phone will now be "free." (The screw holes in the base of the phone are key-shaped or slotted to permit passage of the screw heads.)

Pass the three wires through the indicated hole and secure the back of the Telephone Secretary to the wall by means of flathead screws (if you are fortunate enough to be up against a stud). Otherwise, you will have to use toggle bolts or Molly bolts. *In all cases, make sure that the bolt heads or screw heads are countersunk.* Now, reconnect the wires to their respective binding post.

Temporarily place the phone over the back and mark the new spots for the three roundhead screws which now will have to be inserted of course, into the back of the secretary. Drill pilot holes and drive the screws part way into the wood. Center the telephone over these screws and then drive them home. The next step is to replace the plastic body over the phone. Make sure it snaps into place.

Now, the next time the phone rings, your pen or pencil and paper will be right at hand. •

Play Pool

[*Continued from page* 106]

and facing each other. Glue and nail the lap-cut ends of the five 53¼-inch 2x4's to these: one at each end, one in the center and the other two halfway between.

Flop this frame over, fit the full-size plywood panel into it and secure it with glue and nails. There should be one inch of frame lumber sticking out at each end.

Bore the hole for the electrical bushing to a half-inch depth in the plywood, ¾ inch from one end and centered in the width of the panel. Reset your bit to the outside diameter of the nipple, then continue drilling through the plywood and the end 2x4. Pack the shoulder of this hole with calking. Screw the bush onto the nipple, insert the nipple in the hole and, using the lock nut on the underside, draw the bushing into the calking.

Glue and nail the two 48-inch lengths of 1x1's across the base frame where they abut the ends. Calk the corner formed by the plywood and the quarter-inch extension of the 2x4's, then lay down a bead of glue alongside the calking. Now toe-nail the end panels into place. Nail the vertical 15-inch 2x4's above the joints of the ones that run across the bottom, and glue and nail three 15-inch 1x1's at each end.

Assemble the 101¾-inch and 53¾-inch pieces with the rabbet on the inside. Fit this "collar" over the top of the box and fasten it with glue and nails. Use 3½-inch nails when nailing through the frame and into the ends of the 15-inch 2x4's.

Lastly, prime the box inside and out and finish with two coats of deck paint. •

MATERIAL LIST

2	¾"x4'x8' exterior-grade fir plywood panels.
3	10-foot 2x4's.
3	12-foot 2x4's.
1	14-foot 2x4.
1	1"x2½" nipple.
1	1" lock nut.
1	1" sink plug.
1 pt.	primer paint.
2 qts.	finishing paint.
1 lb.	2 in. galvanized nails.
½ lb.	2½ in. galvanized nails.
¼ lb.	3½ in. galvanized nails.
	calking compound & waterproof glue.

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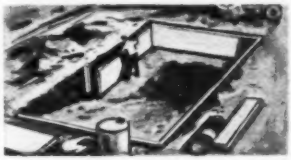

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[*Continued from page* 98]

will be refrigerators built for the back yard; meanwhile there are the little absorbtion-type electrical coolers that run off house current or car or boat battery. A good example is the Escort, which will accompany you on safari or out on the patio with equal aplomb. The Escort weighs 25 lbs. empty and holds up to 25 lbs. of goodies, operates on AC or DC and uses only 55 watts. You can run it off a battery for hours without recharging. Hammacher Schlemmer, $120.

Before I go into a sampling of cookout equipment I'd like to plug a powered version of the old-fashion ice cream freezer called Handyfreeze, because you never lay a hand to a crank to work it. It's the same old freezer but house current turns the mix container inside the bucket of chipped ice and rock salt. Costs about $37.

Cookouts. There's a lot to be said about charcoal cookery as an art—the handiest book on the subject being Barbecue It Right by Harold A. Bartron, a master of the art who began developing his own indoor-outdoor unit after retiring from the army. The Bartron broiler combines grilling with roasting with "rotissing;" it has a movable firepit for cooking several ways and for avoiding the flare-up that comes when drippings hit the fire. Even if you don't buy the unit (for $197.50) it might be good to buy the book.

At the other extreme is the easily understood hibachi which I think is the best-looking outdoor grill; its handsome cast iron will look good in your garden even if your garden doesn't look too hot. Hibachis sell in most department stores for about $20-$30.

Some of the more ambitious and costly barbecues can be used either in or out, with no more adaptation required than rolling them where you want them on their smooth-rolling casters. Units like the Majestic Char-Grill can be set into brick or masonry in the kitchen or outside, or used in a variety of ways. You can attach a powered spit and you can get the Char-Grill in charcoal, gas or electric versions. The Majestic Co., Huntington, Ind.

Royal Chef Barrel Braziers (Chattanooga Royal Co., Chattanooga 6, Tenn.) let you grill your meat out in the open or cover it up with the barrel hood, as you choose. Another covered cooker, in rust-proof cast aluminum, is the Portable Kitchen selling for $62. The Portable Kitchen booklet pushes the idea of smoking your meat by adding damp hickory chips to the charcoal and shutting down the lid.

A number of outfits are selling hickory and applewood chips; Kingsford Co., Iron Mountain, Mich., puts up a Gourmet Gift Pack that includes hickory chips, applewood chips, starting fluid, briquets, a sack of vermiculite fire bedding and a booklet on how to use them.

Powered spits are bringing back one of the finest methods of cookery, which seals the juices into the flesh or fowl as they cook. For getting the same effect with cut-up chicken or meat you can use the Tumble-Action spit basket, self-basting, that is put out by Hewitt Bros. Mfg., National City, Calif., for $6-$8 depending on the size. A visit to your local Outdoor Living store will acquaint you with the fact that spits are being made to fit nearly any charcoal cookery units.

A rank backyard beginner should probably start simply, however, and this need not cost a bundle; you can buy a grill for well under $5 that will cook fish, flesh or fowl deliciously.

Accessories for charcoal cooking should include long-handled tongs, forks, turners, grill scrapers, basting brushes, heat-resistant mitts, wacky apron and comic chef's hat—if you want to go the whole hog. Let your conscience be your guide.

Lighting up your landscape at night is a simple matter and you have plenty of help with it. For lots of functional light when trucking the dinner gear back to the kitchen, a floodlight is the thing. A. K. Electric Corp., 231 Front St., Brooklyn, N. Y., makes one that sells for around $3. Price varies with length of wire. More decorative lights that make the most of the hour and the season come in many forms. Pennington Crafters, Inc., 3412 J St., Philadelphia, Pa., sells a 25-foot string of Party Lights—white globes that look truly

[*Continued on page* 158]

Fishermen!

"This Is The World's Finest Fish Catcher!"

By Paul Stag

How would you like to catch more fish than you ever caught in your life? How would you like to catch fish when they're not biting for other fishermen on the lake? How would you like to never come home empty handed?

I've been fishing for over twenty-five years. I've tried just about every kind of lure I've ever seen in a store or in an advertisement. And just like you, I found that they caught some of the fish some of the time, but most of the time they caught nothing. But now I have found an imported lure that catches fish better than any lure I ever used!

I've caught fish time after time when other fishermen have come home empty handed. I've caught fish on the Vivif when even live bait failed! Vivif has caught fish for me at all hours of the day . . . in all kinds of weather. This amazing lure made fish bite. And now I've gotten the exclusive rights to introduce this lure in America and I'm out to prove my statement: "This is the finest lure ever invented."

A French Invention

This amazing lure was invented in France by a French sportsman who named it "Vivif". He spent years testing every possible kind of lure on fish and watching how they reacted to each lure under water! Who ever did that before? From those years of testing this Frenchman developed Vivif . . . the patented lure with the "Live" tail.

When he started selling Vivif in France it became one of the largest selling fish lures in Europe! Soon its fame spread to 25 foreign lands! From all over came incredible reports of how Vivif caught fish.

Vivif holds a British record in England. It has made amazing catches in Australia, Denmark, France, Germany, South Africa and Canada.

Last winter I started importing Vivif to America. I gave it to expert, experienced fishermen to test. They reported, "We didn't believe it but it's true. Vivif caught fish when other lures failed." That's what hard boiled experts say.

But even more important to you is what other average fishermen say. Here's a typical letter . . . from Mr. Robert Hilton of Jacksonville, Florida. "I have used artificial lures from Canada to Florida and have worn out four spinning reels. The VIVIF is far superior to any lure that I have ever used. The day I used Vivif the bass were not biting, even on live shiners. I caught 6 bass on the lure and then lost it to a large bass. The bass broke water three times trying to throw the lure after he broke my 12 pound monofilament line."

From everywhere come their reports of how Vivif makes fish bite like magic . . . of the magic appeal it seems to have . . . of how it out-fishes and out-catches any lure they have ever used.

Why is this true? Frankly I don't know. All I know is that Vivif is different from any lure you ever used. It's the world's most lifelike lure in the water. It even keeps moving on a slackened line! And it is pure magic with bass, pickerel, pike, trout and other game fish.

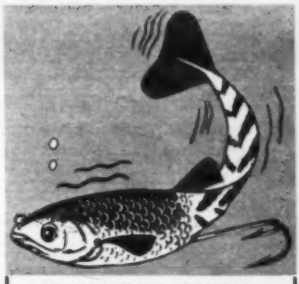
Think what this means to you. Now at last you can catch just about every kind of fresh water gamefish and panfish as well as many salt water fish. You can do away with digging for worms, catching bugs, frogs or minnows. You can cast, troll, shore fish . . . all with equal success. You can go out after . . . and come back with largemouth bass, smallmouth bass, pike, pickerel, perch, trout and walleyes and do it time and again without previous experience and whether you are an expert fisherman or using a cane pole . . . or your money will be refunded *at any time!*

750,000 Vivif Lures Already Being Used!

Seldom if ever has a fish lure received such an exciting reaction from fishermen. Amazing catches have been reported from all over the world. In England Vivif holds a British record! In 25 foreign lands Vivif is catching fish like magic. Already reports from fishermen in this country are pouring in . . . reports saying Vivif is the greatest lure they have ever used. Fishermen in 25 countries can't be wrong. "Vivif is the finest lure I have used in 25 years of fishing!"

Marvel Of Design

Not just another stiff plastic or wood lure that "looks good" but doesn't work. Vivif is made of lifelike latex and is the world's most lifelike lure in the water . . . works better than live bait! Color combinations have been scientifically selected in actual tests . . . never twists your line. Acts and wiggles like a live minnow even on a slackened line.



HOW VIVIF WORKS!

Fish have never seen anything like this lure before. It attracts fish from far away by its vibrating tail that sends "sound waves." It is the world's most lifelike lure in the water. Fish can't resist it . . . and when they grab the lure it "feels lifelike!"—doesn't warn them to spit it out before you can sink the hook in! Read this article and learn the amazing story of this imported lure.

AMAZING TRIAL OFFER!

No longer do you have to come home empty handed from your fishing trips. Try amazing Vivif . . . the French lure designed to attract and catch fish . . . without risking a penny.

All you do is mail the amazing no-risk trial coupon below. When you receive your Vivifs, use them anywhere you like . . . use them as often as you like . . . to prove its fantastic fish-catching powers.

Use it to catch bass, trout, perch, pike, walleyes . . . any fresh water sport or panfish you like to catch as well as salt water game fish.

Let your children and friends fish with Vivif. Put Vivif to every test. If you don't agree it is the finest lure you've ever used . . . if it doesn't catch more fish and bigger fish, you have used it entirely free. It won't cost you a penny.

VIVIF IS IMPORTED SUPPLIES ARE LIMITED

To get your Vivifs now, mail the Amazing no-risk trial coupon below. U.S. supplies are still limited. Order now to be sure you'll have your Vivifs in time for your next fishing trip. Only if you act at once can I guarantee to fill your order immediately. Don't delay. Mail coupon today.

Mail Amazing No-Risk Trial Coupon

Harrison Home Products Corp., Dept. G-361
Fishing Tackle Division
6 Kingsland Avenue, Harrison, New Jersey

Please send VIVIF's checked below on AMAZING TRIAL OFFER. If VIVIF does not catch more fish . . . bigger fish . . . and make fishing more fun . . . if VIVIF is not the greatest lure I've ever used you will refund my money immediately . . . including postage.

Qty.	Size	Weight	Color Comb.	Price	
.....	2¼"	⅛ oz.	Green-Silver-Red	@ $1.35	SAME
.....	2¼"	⅛ oz.	Black & Gold	@ $1.35	ALL 4
.....	2¼"	⅛ oz.	Green-Gold-Red	@ $1.35	FOR $4.95
.....	2¼"	⅛ oz.	Red & White	@ $1.35	
.....	3"	½ oz.	Green-Silver-Red	@ $1.65	
.....	3"	½ oz.	Black-Silver-Red	@ $1.65	ALL 4
.....	3"	½ oz.	Green-Gold-Red	@ $1.65	FOR $6.95
.....	3"	½ oz.	Red & White	@ $1.65	
.....	5½"	2½ oz.	Green & Yellow	@ $2.49	ALL 3
.....	5½"	2½ oz.	Red & White	@ $2.49	FOR $6.95
.....	5½"	2½ oz.	Blue & Silver	@ $2.49	

☐ PAYMENT ENCLOSED. Send VIVIF's Postpaid! I save all C.O.D. Charges. (Money Back Guaranteed on all VIVIF's.)

☐ SEND C.O.D.! I will pay postman price of VIVIF's plus C.O.D. postage. (Money Back Guarantee on all VIVIF's.)

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CANADIAN CUSTOMERS: Order from Harrison Tackle Company, 359 King St. W., Toronto, Ontario.

Outdoor Fun

[*Continued from page* 000]

festive—for $12. These, like many good Outdoor gimmicks, have indoor party uses.

A direct approach to outdoor lighting exists in the torch-on-a-pole type of light, which simply spears into the ground wherever you want it; the light is raised high enough to cast a glow over a wide area and looks romantic as all get-out. A&F sells a kerosene-burning torch for $4.95. A similar spear has an admirably simple light —a fat candle that forms its own translucent chimney as the wick burns down into it. This gives much more light than you might think. If you prefer incandescent lamps the spear-type lamp comes electrified, too, with a good long extension line.

Before leaving you with all this wisdom —here's a tip on anti-insect supplies to beat those tiny Draculas. My favorite rub-on oil is 6-12 Brand Repellent; it makes lazy hours in my backyard jungle endurable. For vengeful fun, you can set up a Detjen Post Lantern with electrocuting grid. Just sit there in the summer evening—sipping your tall drink and smiling at the "psst!" of insects hitting the grid —and think about those fools driving bumper-to-bumper on the highway. •

Tom Tests The Comet

[*Continued from page* 61]

rpm. On the other hand, this axle ratio difference should give the Falcon an economy edge over the Comet and a better mileage factor. I was surprised to find that top speed on the Comet was a solid 89 mph. This is pretty high, considering such things as engine size and overall weight.

In cornering, the new Comet is nice—not sensational but nice. I buzzed it around the 3.1-mile sports car course at the Speedway and though it won't bother any sports car, it did corner respectably for an American car. When it started to slide on a few bends it could quickly be controlled back into line. The entire assembly is nicely thought-out and the unitized body construction kept it rattle-free and squeak-proof throughout our tests.

These jobs have a tremendous trunk for their size—26.6 cubic feet. I wish they had taken a little of this space and added it to the inside cabin. The interior room was fair but my biggest objection was to the steering wheel protruding too far into the body, making handling slightly awkward regardless of seat position or whether you weigh 110 pounds or 300. The legroom was quite ample but the steering wheel position gave me a choked-up feeling.

Some other features are a cowl that slants toward the front, allowing you to keep your opium pipe within easy reach. A big feature was the manual choke which should save a lot of gas. Tired, old thermostatic controls on automatic chokes help Standard Oil to pay a couple of extra cents in dividends each year. The headlining was a very unobjectionable plastic-type gooze that not only looked neat but felt good to the touch. The coachwork, in the best Mercury tradition, feels solid and enduring. The windshield wipers work in tandem, in typical Mercury fashion, and each fender is decorated by little Mercury bombsight decorations.

The door openings, which are high due to the flat-type roof, make getting in and out of this cricket a lot easier than in some compacts. The ride, even over the toughest potted roads, was fairly comfortable and, best of all, quiet. There was no thumping or bottom banging. The instruments, in addition to the speedometer, consist of a real fuel gauge and a temperature gauge. The ammeter and oil gauge are idiot lights.

To check out the control and balance of the car we first took it to the beach where I made full lock-to-lock spins at various speeds. This rig is solid and at no time did it even approach the roll-over point. However, I did almost get a ticket from the Beach Patrol who thought this was pretty reckless driving. Back at the Speedway (and remember, this car was so new it had less miles on it than a three-day-old caterpillar), I lapped the track several times and must report that even when this job is flat-out there was no surging, no feeling that the engine was trying to break loose from its mounts and sail into orbit.

It is a fairly fine performer with one notable exception—in the torque department it feels a little skinny. On some main highways where the speed limit was 65 mph, I got behind a poker moseying along at 48-50 mph and wanted to pass him fast.

Putting the throttle to the floor got the cramps out of my foot and little more. You can get from 40-60 with this rig in just under nine seconds but you have to be in second gear at the start and wind it up to about 55 mph, then drop it in. It will go all the way to 60 mph in second but you feel like the countdown boys at Canaveral and expect to see pieces of flywheel come through the floor any second. So a guy cruising ahead of you on the open road at 48-50 mph becomes quite a problem to pass unless you have lots of room and time.

What has been the impact on sales of these new-size cars? Dealers in the compacts are happy with their sales results but the new cars have just about dealt the *coup de grace* to the used car market. One dealer said to me just yesterday, "How can I convince a guy that he's better off with a two-year-old big used car than with a brand-new compact that will serve him just as well and in many cases better?" This is a more serious situation than you might believe at first glance. As used cars

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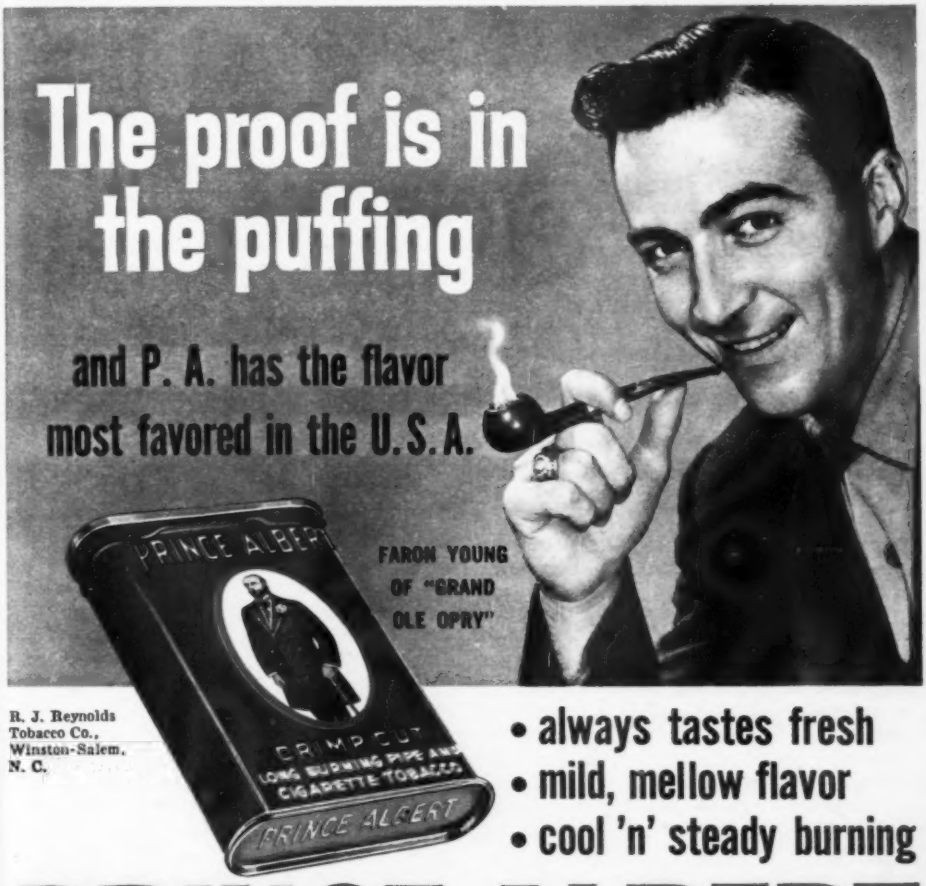

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get harder to sell, one or two things must happen at trade-in time: either allowances will be cut or new cars will be given higher "pads"—puffed-up, phony prices for trading purposes.

Now, if you bought a new standard-size car within the last few months you may not be confronted by this situation for another year or two but it's got to come. You may find that the depreciation on your car will be greater than ever when trade-in time rolls around—and the new batch of compact cars can take full blame.

Last week I attended a wholesale auction where cars are brought by various overloaded dealers trying to realize some cash from their used car inventories. The dealer I went with had six cars in the auction with low, knocked-down prices. Only one of them was sold. Three or four-year-old cars were going for almost bicycle prices and oddball makes just didn't receive bids at all. These men were trying to unload and at the same time pick up bargains for their used car lots. The prices were anything but gratifying and when I questioned a few prominent operators they all had the same story—good $800 to $1,200 used cars were selling but you couldn't give the $2,000 rigs away. As one dealer told me, "When a guy is buying and has two grand to spend, he'll take a brand-new car over a used ex-glamor queen."

In summing up, this latest entry into the compact car race has enough looks to satisfy just about any American car buyer's taste. It has a fair head of performance, is well-built and the riding qualities are excellent. The economy (which we didn't test) should prove satisfactory. There will be a question in some people's minds as to whether a 114"-wheelbase sedan *is* a compact car, even though its overall length is a good two feet less than most of the Big Three. As far as I'm concerned the Comet does fit in the compact car category. I like the NASCAR's rule: a "compact car" must have a power plant of less than 200 cubic inches and cost under $2,500. Our test Comet was as bare as a bubble dancer at a pin makers' convention. It's price is comparable to the other compacts in similar condition. If you are in the market for a compact, buzz over to your friendly Lincoln-Mercury dealer and make him show you a Comet. •

McCahill Tests Buick

[*Continued from page* 91]

champ? These cars have not changed too much, except in looks, since last year. And the 1959 models, as we reported, were good automobiles, the best Buicks Buick ever built. I've had my test car for over two months now and we've used it for just about everything from hauling dogs to the vet to turning a few fast laps on the Daytona International Speedway. The Invicta is the hot model—the big engine and small chassis. This job was known as the Century until 1959.

Over rough, potted roads (and we have some beauts in Volusia County) this Buick smoothed them out just about as well as any car on the road, regardless of size and price. The power steering is excellent. The car handles in traffic like a bantamweight and the brakes are truly outstanding. On the road through hard bends and turns this is not a sports car, by any stretch of the imagination, but it has better cornering properties than some of its competitors, especially in the General Motors camp. One accessory that came with the car, and which delighted me no end, shows the Yankee influence of Michigan, even way down in the Deep South. No matter which direction you traveled, the compass read North.

The upholstery is nice though not lush. The instrument panel is a real futuristic nightmare. What you see are the dial-readings reflected into a mirror. This mirror can be adjusted up or down to accommodate any seating position. The Buick sports a full array of idiot lights and, aside from the odometer and speedometer, the fuel gauge is the only real instrument. The rear-view mirror blocks forward visibility.

The horn is blown by depressing slots on the port and starboard sides of the steering wheel. This is not the greatest invention I've ever seen. In fact, if you need a horn in an emergency and aren't too familiar with this rig, you'd be better off sticking your head out the window and yelling. The trunk is ample but not mammoth. The rear-seat footroom is fair but it is a little hard to clamber into the back seat of the two-door job unless you assume the correct jump position first.

Our test car had air conditioning which was colder than a mother-in-law's stare when she spots you in a saloon. In addition to the air conditioning, this car had good body air vents for scooping in air when the weather isn't quite hot enough for conditioning. This is fairly rare in air-conditioned cars. You usually get air vents *or* air conditioning, not both. The car radio was one of the best I've ever listened to and had the tone of a $1,000 console.

One of the best ways I can judge a car is to observe how it is used when it's on my test lot. At one time this past winter I had five test cars there, plus three of my own. The keys were in all of them. When errands had to be made or a house guest wanted to borrow a car, it was always interesting to me to see which they'd pick because I would always say, "Help yourself, take any of them." Recently I noticed that the Buick was getting the biggest play. I cornered my wife one day and asked her why she'd taken the Buick several times in a row instead of any of the other cars. Her answer was, "I find it easy to handle and easy to park. Besides, the gas tank is full"—a typical reaction.

One day, just before the dove shooting season closed, I took the Buick on a long run into back country as my Land Rover was being serviced. I left the road at one point and soon found I was running through some pretty heavy muckland, with water almost up to the hubs. As I continued, the going got worse instead of better. Soon I found myself miles from nowhere, up an old lumber path—and stuck. I switched off the engine, got out and took a look and saw that, though I was in deep, if I could pull just another 25 feet without burying the car down under the trunk, I just might get free. As I've written on these pages in the past, DynaFlow is just about the smoothest of all automatic transmissions and in a spot like this you need smoothness. I started the engine, dropped it into first and then ever so gently applied throttle. There were a couple of thumps and then, very gradually, the Invicta started to ease through the mush. I held my breath but I finally made high ground and eventually got home.

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[*Continued on next page*]

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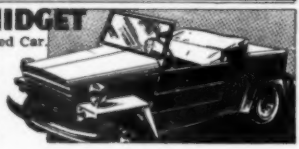

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Penn Yan Boats

find in the crib of a six-month-old baby. As no one knew just where I was, I'd probably still be there if the DynaFlow hadn't pulled me through. I made a number of other trips with this car, beating it across sand strips, over non-existing roads and on some real major highways. This is the kind of car you wouldn't think twice about driving to California, if you lived in New York, or vice versa. It has a top head of performance, proven by the 10,000-mile run, and won't embarrass you at a traffic light as it can dig out to 60 mph from a standstill in 8.9 seconds. For passing it can whip from 40 to 60 mph in 4.8 seconds.

In summing up, the Buick Invicta is a good automobile, perhaps not the most interesting we've ever tested or even the hottest, but excellent transportation—as reliable as snow in the Arctic during January. This is an "honest dollar" car. Why Buicks haven't been selling as they once did is a matter of conjecture. Personally, I think it's because they changed their names from Roadmaster, Century and Special to names few people can separate any more. I think this has hurt Buick sales—but the cars are better than ever. •

Restring Tennis Racket

[*Continued from page* 63]

the grip. Now screw the head clamp on the top center and you are ready to begin. (Look at the photo and you will see the head clamp; it comes with the vise.)

The nylon strings you will use come in several different types: monofilament, multi-ply and pro-fected. Most players prefer the pro-fected. Ashaway Co. supplies it through all sporting goods stores. It

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comes in ebony and white spiral and can be bought in 15- or 16-gauge. The 15 gauge is considered a service weight and stands up longer. Each set comes in a 36-foot length.

Upon opening a set you cut the string into two lengths, one of 15 feet for use in the horizontal stringing of the racket, and the other 21 feet for the vertical stringing.

With the vertical set in hand, thread the nylon through the two perforations at the top center of the racket head. Run the strings in equal lengths toward the two middle holes at the base or throat of the frame.

Now place an awl in each of the two holes at the top center in order to hold your string in place while you impart the necessary tension.

Take your dowel and wind the string around it two or three times before pulling. Most stringers obtain the tension by turning the dowel but it can be done by a straight pull. Care must be taken to run the string straight out of the perforation; if it is against the wood around the hole there is a chance of cutting the nylon.

Tennis players like a tight job and the string should be stretched very firmly. To prevent the nylon slipping back or loosening when the next string is put in, the point of an awl should be placed in the perforation and pressed fairly hard against the nylon.

Continue with the vertical stringing by running the lengths through the nearest perforations, then pulling and securing each strand with a dowel and awl.

On the ninth string, counting from the center toward each side of the frame, the nylon should be tied off. This is done by running the end into a hole and making a loop around one of the vertical lengths to secure the simple knot.

When this is completed, you are ready to weave the cross-string into the racket.

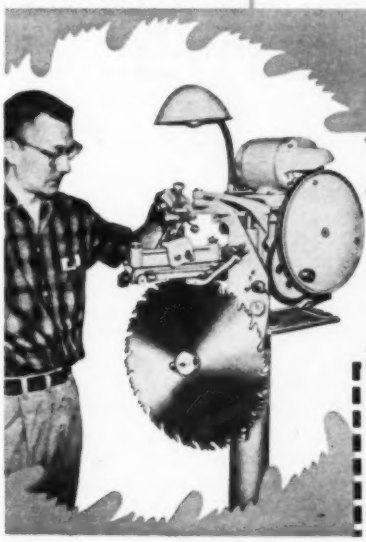
Take the shorter length and anchor the end to the vertical string next to the knot you made at the base of the frame. To do this, the same loop-around and pull-through knot is utilized. A drop of clear shellac should be placed on the knot to help it retain the setting.

[*Continued on next page*]

CASH FILING SAWS

Make from $3 to $6 an hour in spare time

This one machine files all these saws



Here is a steady repeat CASH business you can start at home in your basement or garage, while you are working at your regular job. No experience is necessary to turn out perfect cutting saws—"The first saw I sharpened came out 100%. I think the Foley Saw Filer is a marvel of perfection," writes Clarence E. Parsons. No canvassing—every saw you sharpen will bring you new customers. You will find you can make up to $3 or $6 an hour—$20 to $30 a week in your spare time as a starter. "My spare time saw filing business has made me $952 these first ten months," says R. T. Chapman.

The new model 200 Foley Saw Filer (shown here) is the first and only machine that automatically sharpens combination (rip and crosscut) circular saws—also all hand saws, band saws and crosscut circular saws. It is easy to operate—simple adjustments—no eyestrain.

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Weave the loose end of your string over and under each vertical strand of nylon. At each side of the frame, tighten the length with the dowel and insert an awl to keep it in place. These cross-strings are continued to the top bevel of the racket head. They are tied off on the fourth vertical string counting from the outside edge toward the center. A drop of shellac is placed here and your racket is now complete and ready for play.

Be sure to take advantage of the extra income that can be made by stocking tennis presses, covers and balls. A frame should be placed in a press to keep it from warping and as most presses are made from an inexpensive wood, they ought to be replaced each year.

Sell your customers on the idea that a rubberized cover is cheap insurance for a good tennis racket. The nylon won't be injured by moisture but rain can do real damage to the ash or bamboo in the frame.

If you send out post cards in the early spring months, you'll get a lot of new prospects for stringing jobs—and don't overlook the big potential of out-of-town customers who can mail in their rackets.

When is the best time to launch your new stringing business? Well, while tennis is a year-around sport in some sections of the country, it is seasonal in most and extends from March through October. It would be wise to open each year in the spring months. You may wish to advertise through the mail and in newspapers as early as February or March.

There is always a surge in tennis interest in June when schools are out and the young folks have more time to play. Since the season extends well into October, a shop in your spare room will be profitable even if begun as late as July or August.

Anyone, young or old, can learn to string and repair frames. Over a period of 20 years I have taught boys of 13 and retired men in their middle 60s to turn out a first-class job. It's a great chance to pick up spare dollars in a field that's wide open. •

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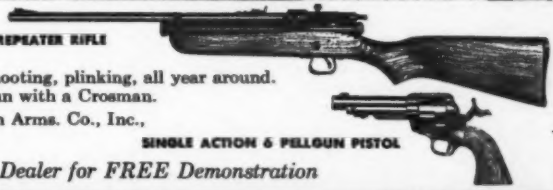
Nelson Fox



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PELLGUNS BB GUNS

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Backyards Into Fairways

[*Continued from page* 80]

lescing from a broken right hip socket sustained in a fall, and longing for an opportunity to swing his clubs again. Why not hook a golf ball to a string, he thought.

Nat began collecting materials—an assortment of string, wire, nuts and bolts and tools—and turned his cellar into a workshop. He tried 40 different ways of securing a regulation golf ball to a cord, string, wire and just about anything else you can name in order to have the ball return to the tee after it was hit by the golfer.

The device that Nat finally devised is a very simple gadget. It consists of a patented, "stabilized cord" 15 feet long attached and locked onto the golf ball by a special pin. The other end of the cord is connected to a small wood block that is one and one-half inches square. Two five-inch spikes anchor the block in the ground.

When the golfer wants to tee off, he merely stretches the cord on the ground on a straight line 15 feet behind the block. Returno can be used to practice with any club in the golfer's bag. A well hit ball goes forward 30 feet at which point the cord's recoil action goes into play and returns it almost to the feet of the driver. A slice or push knocks the ball to the left side. A hook goes to the right. A topped or scuffed ball will roll on the ground and remain where it stops. That's the only kind you have to retrieve yourself.

A neighbor of Nat's who saw Returno in its rough form suggested that he market the device. The two men then formed the Returno Golf Co., 31 West 47 Street, N. Y. 36, N. Y., where Returno is sold for $3.98.

Nat's patented cord has a jerk tension of 170 pounds. He claims that it should last for at least 1,000 shots. Returno should convert quite a few backyards this year, Nat Cabot believes. He could be right.

Fore! •

—*Rudy Arnold*

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Push-Away Wrecker

[*Continued from page* 70]

easy reach, crewmen in spacesuits exit through air-locks on either side of the control room. Using individual reaction bottles, they carry lines to the dead satellite and clamp them to convenient tail surfaces. They then return to the tug and haul it forward until its nose cone is snug in the satellite's rocket nozzle. A set of powerful arms clamp around the nozzle's exterior, lines are retrieved and the tug is ready for action. Its ion engines are switched into full reverse and the linked machines gradually lose momentum. As the balance of forces is broken, they nose into a spiral path downward toward the planet below. When a safe point is reached, the towboat unclasps its arms and permits the dead satellite to continue on and crash. In the case of Earth or Venus orbits, the plummeting machine will be consumed by the friction of the thickening atmosphere.

MI's design calls for a crew of six, working in three shifts. During hookup operations, all hands "turn to." The men are provided with double-ended living quarters to permit the reversal of floor and ceiling as the craft travels ahead or astern. This is to take advantage of the artificial gravity resulting from constant acceleration or deceleration. Duplicate sleeping cabins, lounge, dinette and galley, are built into each end of the living compartment. An air conditioning section processes the interior atmosphere. It maintains uniform pressure, feeds exhaled carbon-dioxide to a tubular hydroponic garden and draws off fresh oxygen from the growing plants. The harvested algae are dried, bleached in the sun and stored as a protein food additive. Excess crops are vented overboard. The crew's body wastes and moisture are recovered and reused as fertilizer and water.

Like the Space Lifeboat described in our February issue, this Cosmic Towboat may seem premature. However, it is a possible solution of what now looks like an inevitable dilemma—ridding the best orbits in space of the dead satellites and probes that will be the debris of man's first, faltering steps into the unknown. •

Tackle For Surfing

[*Continued from page* 84]

The tyro surf caster usually does one of four things: He joins a good surf casting club; he hires an expert instructor; he gets a friend to initiate him; or he ventures out alone and learns the hard and costly way. All well and good if he does one of the first three *before* he buys his tackle. The only trouble is that the average novice does these things *after* he has bought his tackle.

Actually, it is simple for the beginner to buy suitable gear. When you walk into a well-equipped tackle shop, you'll find two classes of surf tackle: spinning and bait casting. The latter is commonly called standard gear. Spinning tackle suitable for surf casting comes in heavy and medium action. Some stores also carry fresh water spinning tackle that they recommend for light saltwater spinning. The standard tackle is shown in heavy, medium and light. There are rods, reels, lines and lures of all descriptions. Yet each has its own special purpose.

The beginner must realize that rods are built with action that will handle lures of definite weights and no others. A light spin rod, for example, will handle lures weighing up to one ounce and no more. They won't cast those light lures out beyond the horizon, either. These light outfits are more suited to bay, inlet and pier fishing than casting into the surf, and experts limit their use accordingly. Medium spin rods will handle lures weighing between one and two ounces, and heavy spin tackle will take lures between two and four ounces.

[*Continued on next page*]

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CRITERION CO., Dept. SML-96, 331 Church St., Hartford, Conn.

Light standard rods will cast lures weighing between one and two-and-one-half ounces only, medium standard rods will handle lures weighing between two and four ounces and heavy tackle will pitch lures weighing between three and five ounces.

I suggest the beginner buy a medium spinning outfit with suitable lures and use it until he has mastered it. First, the rod should be glass, preferably hollow glass and well-made. It should be about nine feet long with fast action. The spinning reel should be a saltwater reel, the best you can afford. A cheap spinning reel is just asking for trouble. Your spinning reel is more important than your rod, so if necessary cut down on the cost of the rod and add the saving to the price of the reel. The reel should have a spool capacity of 200 yards of ten-pound test line.

If the beginner doesn't want a spinning outfit, he should start with a medium standard bait rod, reel and line. These rods go from eight and one-half to 11 feet and are more difficult to cast than the spinning outfits. Get the best saltwater casting reel you can afford and be sure it will hold at least 200 yards of line, testing as high as 36 pounds.

Heavy combinations are built for experts fishing big surfs when large lures must be pitched into strong winds and over high, curling waves. They are also used by the pros to get more reach in calm weather. Beginners should avoid such gear.

However, even the finest and best matched tackle is not going to catch fish for you unless the lures are right and you have a thorough working knowledge of surf fishing. Briefly, the best neophyte lures are the artificial squid. Squid come in many shapes, actions and finishes and of various materials such as lead, brass, copper, nickel and block tin. They are fashioned to imitate several different kinds of bait fish that feed in the surf and are generally used from dawn until sunset.

When game fish are driving the bait fish to the surface, I use the flat, shallow-keeled squid that rides beautifully on or near the top. It is also excellent for fishing fast currents, shoaling water and where fast water drops off suddenly into deep holes.

When fish are feeding deep, I like the narrow, deep-keeled squid. It goes down like lead, then skims along the bottom where the big fish are feeding. It is also dandy for heavy surfs and powerful tides.

When you are lucky enough to find sand eels plentiful, one of the best foods for game fish in the surf, try the thin, flat squid that imitates these little fish.

There are countless other lures but they all require more skill than any beginner is apt to have. I suggest that he limit himself to the various squid, or bait, until he can fish with them. Then he can begin to think of other tackle. By that time he should have made enough acquaintances among the experts to have all the help he needs in making additions to his basic tackle.

In the meantime, enjoy yourself with a medium spinning outfit and half a dozen squid and a little bait on the side. You'll be surprised at the number of fish you'll take and the fun you'll have. Good luck now! •

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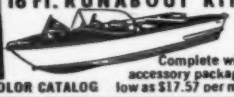

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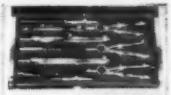

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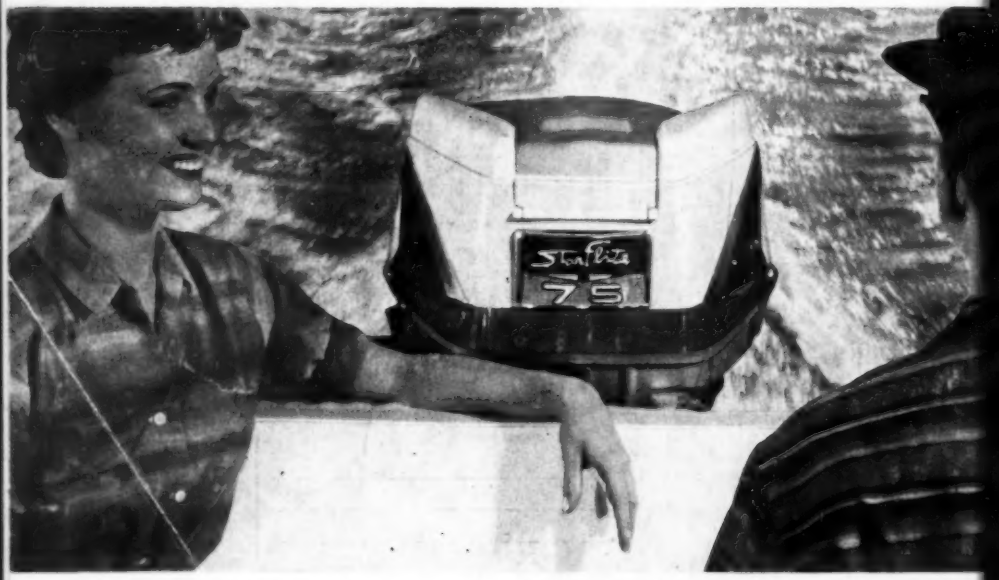

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